

## 5.2 Biological Resources

### 5.2.1 Introduction

The Applicant proposes to develop a solar energy project called the Ivanpah Solar Electric Generating System (Ivanpah SEGS). It will be located in southern California's Mojave Desert, near the Nevada border, to the west of Ivanpah Dry Lake. The project will be located in San Bernardino County, California, on federal land managed by the Bureau of Land Management (BLM). It will be constructed in three phases: two 100-MW phases (known as Ivanpah 1 and 2) and a 200-MW phase (Ivanpah 3). The phasing is planned so that Ivanpah 1 (the southernmost site) will be constructed first, followed by Ivanpah 2 (the middle site), then Ivanpah 3 (the 200-MW plant on the north), though the order of construction may change. Each 100-MW site requires about 850 acres (or 1.3 square miles); the 200-MW site is about 1,660 acres (or about 2.6 square miles). The total area required for all three phases, including the Administration/Operations and Maintenance building and substation, is approximately 3,400 acres (Figure 1.2-3). The Applicant has applied for right-of-way grants for the land from BLM. Although this is a phased project, it is being analyzed as if all phases are operational.

The heliostat (or mirror) fields focus solar energy on the power tower receivers near the center of each of the heliostat arrays (the 100-MW plants have three arrays and the 200-MW plant has four arrays). In each plant, one Rankine-cycle reheat steam turbine receives live steam from the solar boilers and reheat steam from one solar reheater (located in the power block at the top of its own tower). The solar field and power generation equipment are started each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to keep the turbine online.

Ivanpah 1, 2 and 3 will be interconnected to the Southern California Edison (SCE) grid through upgrades to SCE's 115-kV line passing through the site on a northeast-southwest right-of-way. These upgrades will include the construction by SCE of a new 220/115-kV breaker-and-a-half substation between the Ivanpah 1 and 2 project sites. This new substation and the 220-kV upgrades will be for the benefit of Ivanpah and other Interconnection Customers in the region. The existing 115-kV transmission line from the El Dorado substation will be replaced with a double-circuit 220-kV overhead line that will be interconnected to the new substation. Power from Ivanpah 1, 2, and 3 will be transmitted at 115 kV to the new substation. SCE may add three new 115-kV lines to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest. The timing of this upgrade depends upon the development of wind projects ahead in the queue, and is not affected by the Ivanpah SEGS project.

Each phase of the project includes a small package natural gas-fired start-up boiler to provide heat for plant start-up and during temporary cloud cover. The project's natural gas system will be connected to the Kern River Gas Transmission Line, which passes less than half a mile to the north of the project site. Raw water will be drawn daily from one of two onsite wells, located east of Ivanpah 2. Each well will have sufficient capacity to supply water for all three phases. Groundwater will go through a treatment system for use as boiler make-up water and to wash the heliostats. To save water in the site's desert environment, each plant will use a dry-cooling condenser. Water consumption is, therefore, minimal

(estimated at no more than 100 acre-feet/year for all three phases). Each phase also includes a small onsite wastewater plant located in the power block that treats wastewater from domestic waste streams such as showers and toilets. A larger sewage package treatment plant will also be located at the Administration/Operations and Maintenance area, located between Ivanpah 1 and 2. Sewage sludge will be removed from the site by a sanitary service provider. No wastewater will be generated by the system, except for a small stream that will be treated and used for landscape irrigation. If necessary, a small filter/purification system will be used to provide potable water at the Administration Building.

Extensive grading of the site will be limited to the power block areas, receiving towers and the major access roads (asphalt roads between power blocks and gravel roads servicing the receiving towers from the power blocks). Within the heliostat array fields, grading is to be performed only between every other row of the heliostat arrays that radiate outward in concentric arcs from their associated receiving towers. The cleared rows will provide access from either side of the road for the service and cleaning of the heliostat mirrors thus minimizing soil disturbance within the heliostat array fields.

All vegetation within the heliostat array fields will be cut to the soil surface to reduce the risk of fire. Existing root systems will remain in place to anchor the soil reducing the potential for erosion. Occasional cutting of the vegetation will be required to control plant re-growth. All cut vegetation is not to leave the site but is to be buried, burned, or composted onsite to limit waste disposal. Heliostat foundations may consist of steel posts with concrete foundations or driven concrete filled steel pipes (exact method to be determined at a later date). It should be noted that a minimum amount of cutting and filling within these access rows is anticipated. Some re-grading for maintenance will most likely be required within the access road due to soil erosion and regular use.

In areas of substantial grading (Power Block areas, the Receiving Towers and the major access roads), the barrel cactus and Mojave yucca that would otherwise be removed or otherwise impacted during construction will be offered up for a public salvage prior to project construction per BLM policy. All plant salvage activities will occur after the sites have been cleared for desert tortoise and will be coordinated by the biological construction monitor to ensure that plant salvage complies with desert tortoise protection measures.

This section describes the biological resource laws, ordinances, regulations, and standards (LORS) that may apply to the project. The LORS are listed in Section 5.2.2. A discussion of existing biological resources in the project area is included in Section 5.2.3, Affected Environment. The Environmental Analysis to determine potential impacts to biological resources due to project implementation and potential cumulative effects are provided in Sections 5.2.4 and 5.2.5, respectively. Mitigation measures proposed for the project are provided in Section 5.2.6 and agencies and agency contacts are included in Section 5.2.7. Lastly, permits and schedules and the references cited in the preparation of this section are listed in Sections 5.2.8 and Section 5.2.9, respectively.

For purposes of this analysis, the project Area is defined as the area within 1 mile of the site boundaries and within 0.25 mile of the centerline of proposed linear facilities. All linear facilities are within the site boundaries, with the exception of the two new water wells (and approximately 570 feet of the associated water pipeline) and a portion of the 5.3-mile-long, 4- to 6--inch-diameter natural gas pipeline, which would extend from the Kern River Gas

Transmission Company to Ivanpah 1. However, less than one-half mile of the gas line is outside the site boundary (from the Kern River Gas Transmission line to the north edge of Ivanpah 3). Other linears include proposed transmission towers from the power block to the new substation; a portion of which are outside the site boundaries. All tables, figures, and other supporting documents (Appendixes) referenced in this section are located at the end of this section.

## 5.2.2 Laws, Ordinances, Regulations, and Standards

This section describes the LORS related to biological resource protection. The following sections and Table 5.2-1 describe the primary LORS and list the responsible governmental agencies. The primary federal and State of California regulatory agencies include the United States Fish and Wildlife Service (USFWS), United States Bureau of Land Management (BLM), United States Army Corps of Engineers (USACE), California Energy Commission (CEC), California Department of Fish and Game (CDFG), and the Lahontan Regional Water Quality Control Board (LRWQCB).

## 5.2.3 Federal LORS

### 5.2.3.1 Federal Endangered Species Act, Section 7 (FESA, 16 USC §§1531 et seq., and 50 CFR § 17.1 et seq.)

This act provides for the designation and protection of threatened and endangered plant and animal species and habitat critical to their survival. The Act authorizes the USFWS to review a proposed Federal action to assess potential impacts to listed species. Listed species are those that are endangered or threatened and have been listed in the Federal Register. The FESA prohibits the “take” of listed species. The FESA and implementing regulations define “take” to include mortality and other actions that may result in adverse impacts such as harassment, harm, or loss of critical habitat. Federal or private action that may result in a take of a listed species requires consultation with the USFWS pursuant to sections 7 or 10 of the FESA. The USFWS may issue an incidental take permit after issuance of a biological opinion.

### 5.2.3.2 Clean Water Act (CWA), Section 404 (33 USC §1344)

This act requires activities that have the potential to discharge fill materials into “waters of the United States,” including wetlands, are regulated under Section 404 of the CWA, as administered by the USACE. Fill activities may be permitted under a Nationwide or Individual Permit. The Nationwide Permit Program involves certain activities that the USACE has preauthorized. Individual Permit applications are submitted to USACE. Section 404 (1)(b) guidelines require USACE to rule in favor of the least environmentally damaging practicable alternative when multiple alternatives are available for a project. Typically, USACE requires mitigation in the form of restoration of areas of temporary impacts, and restoration/enhancement of additional wetland areas at a specified ratio of impacts. Alternatively, in-lieu fees can be paid into a mitigation banking fund.

### 5.2.3.3 Clean Water Act (CWA), Section 401

This act requires projects needing a Section 404 permit also acquire a CWA Section 401 Water Quality Certification issued by the appropriate RWQCB. Section 401 of the CWA,

governed by 33 USC 1341 and 40 CFR 121, requires a water quality certification from the RWQCB when a project will: (1) require a federal license or permit, and (2) result in a discharge to waters of the United States. Such certification may be conditioned.

#### **5.2.3.4 Migratory Bird Treaty Act (MBTA) (16 USC §703–712; 50 CFR §10)**

This act prohibits the “take” of migratory birds and their active nests containing eggs or young unless permitted. This regulation can constrain construction activities that have the potential to affect nesting birds either through vegetation removal and land clearing, or other construction or operation related disturbance.

#### **5.2.3.5 Bald and Golden Eagle Protection Act (BGEPA) (16 USC §668; 50 CFR §22 et seq.)**

This act protects bald and golden eagles from harm or trade in parts of these species.

#### **5.2.3.6 California Desert Protection Act of 1994 (CDPA)**

An Act of Congress which established 69 wilderness areas, the Mojave National Preserve (MNP), and expanded Joshua Tree and Death Valley National Monuments and redefined them as National Parks. Lands transferred to the National Park Service (NPS) were formerly administered by the BLM and included significant portions of grazing allotments, wild horse and burro Herd Management Areas, and Herd Areas.

#### **5.2.3.7 California Desert Conservation Area Plan**

The California Desert Conservation Area (CDCA) comprises one of two national conservation areas established by Congress at the time of the passage of the Federal Land and Policy Management Act (FLPMA). The FLPMA outlines how the Bureau of Land Management will manage public lands. Congress specifically provided guidance for the management of the CDCA and directed the development of the 1980 CDCA Plan (BLM, 1980).

#### **5.2.3.8 Northern and Eastern Mojave (NEMO) Coordinated Management Plan**

As an amendment to the CDCA Plan, the BLM produced the Northern and Eastern Mojave (NEMO) Coordinated Management Plan (BLM, 2002). This document consists of proposed management actions and alternatives for public lands in the NEMO Planning Area. This area encompasses 3.3 million acres and is located in the Mojave Desert in southeastern California adjacent to Nevada. The area borders Nevada on the east, Fort Irwin and the West Mojave (WEMO) Planning Area on the west, and I-40 and the Northern and Eastern Colorado (NECO) Planning Area on the south. The Ivanpah SEGS site is located in the southeastern portion of the NEMO Planning Area Boundary. The NEMO plan goals include the following:

- Adopt standards for public land health and guidelines for grazing management in the Planning Area;
- Identify management actions to conserve and recover threatened and endangered (T&E) species, particularly the desert tortoise, Amargosa vole, three listed riparian obligate birds and three listed plants, as well as species that may be considered for listing in the reasonably foreseeable future;



- Make Multiple-use Class (MUC) decisions for lands released from wilderness consideration and make changes required to make the CDCA Plan conform to the California Desert Protection Act (CDPA);
- Adopt an off-highway vehicle (OHV) strategy for motorized competitive speed events;
- Adopt a strategy for route designation in the NEMO Planning Area consistent with 43 CFR 8342.1.
- Change the Multiple-Use Class to enable disposal of existing landfills on public lands in the Planning Area; and
- Identify potentially eligible river segments on public lands for inclusion in the National Wild and Scenic Rivers System.

This NEMO planning effort was partially developed in response to the USFWS recovery plans for the federally and State of California listed desert tortoise and Amargosa vole. The NEMO plan adopted the goals of both recovery plans and the recovery objectives for the Amargosa vole. For desert tortoise, this planning effort has developed strategies that vary in some respects from the recommended actions in the USFWS recovery plan. These differences are based on identifying recovery unit and Desert Wildlife Management Area (DWMA) specific alternatives to meet the goals of the USFWS recovery plan.

#### 5.2.3.9 USFWS Desert Tortoise Recovery Plan and Critical Habitat Designation

The project site is in the general area addressed by the *Desert Tortoise Recovery Plan* (USFWS, 1994b). The recovery plan describes a strategy for recovery and delisting of the desert tortoise. Key to the strategy is the establishment of at least one DWMA and implementation of reserve-level protection within each DWMA so as to maintain at least one viable population at a minimum density of 10 adult desert tortoises per square mile within each of the six recovery units. Based on genetic and demographic considerations outlined in the Plan, it is recommended that each DWMA within a recovery unit be at least 1,000 square miles in extent so as to contain a viable population of desert tortoises that is relatively resistant to extinction processes. To ensure population persistence, the recovery plan proposes multiple DWMAs connected by protected functional habitat within recovery units wherever enough extant desert tortoise habitat exists. A total of 14 DWMAs are proposed in the recovery plan (USFWS, 1994b).

On February 8, 1994, the USFWS published a final rule in the *Federal Register* (59 FR 5820) designating 6.4 million acres of critical habitat for the Mojave population of the desert tortoise (USFWS, 1994a). This designation includes primarily federal lands in southwestern Utah, northwestern Arizona, southern Nevada, and southern California. In California, the critical habitat designation totals 4,754,000 acres in Imperial, Kern, Los Angeles, Riverside, and San Bernardino counties. Of this amount, 3,327,400 acres are on BLM-managed lands. The project site does not lie within critical habitat for the desert tortoise; however, the Ivanpah critical habitat unit is located west, south, and southeast of the site. The project site lies approximately 5 miles from the nearest portion of the Ivanpah critical habitat unit, just north of the Interstate 15 (I-15) and Route 164 interchange.

## 5.2.4 State LORS

### 5.2.4.1 California Endangered Species Act (CESA) (California Fish and Game Code §§2050 et seq.)

This act prohibits any activities that would jeopardize or take a species listed as threatened or endangered within the State of California. Projects that have the potential to impact wildlife species listed as threatened or endangered by the state may require an Incidental Take Permit from the CDFG under California Fish and Game Code Section 2081. The application for this permit requires a project description, analysis of impacts to the species, and an analysis of the probability of the long-term survival of the wildlife species as related to impacts. Project impacts to species on the CESA list would be considered significant and would require mitigation. Impacts to species of concern would be considered significant under circumstances discussed in later sections of this report

### 5.2.4.2 Native Plant Protection Act

The Native Plant Protection Act (NPPA) of the 1977 Fish and Game Code (Sections 1900-1913) directed the CDFG to carry out the Legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The NPPA gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take.

### 5.2.4.3 California Endangered Species Act

The California Endangered Species Act of 1984 (Fish and Game Code Sections 2050-2116), expanded upon the original NPPA and enhanced legal protection for plants, but the NPPA remains part of the Fish and Game Code. To align with Federal regulations, the California Endangered Species Act (CESA) created the categories of "threatened" and "endangered" species. It converted all "rare" animals into the Act as threatened species, but did not do so for rare plants. Thus, there are three listing categories for plants in California: rare, threatened, and endangered. Take of state-listed plants is prohibited under CESA but destruction of state-listed plants is allowed under limited circumstances. The CESA also requires mitigation for impacts to species and their habitat (California Native Plant Society [CNPS] 2001). The CDFG requires a CESA Section 2081 (a) permit for take of candidate or listed threatened and endangered plants for scientific, educational, or management purposes, and a CESA Section 2081 (b) permit for incidental take of listed threatened and endangered plants from all activities, except those specifically authorized by the NPPA. Because plants designated as rare are not included in the CESA, mitigation measures for impacts to plants designated as rare are specified in a formal agreement between the CDFG and the project proponent.

### 5.2.4.4 California Department of Fish and Game Code Section 1600, Streambed Alteration Agreement

This code regulates the alteration of the bed, bank, or channel of a stream, river, or lake, including ephemeral washes. The limit of jurisdiction is subject to the judgment of the CDFG and can include up to the 100-year floodplain level. However, CDFG generally asserts jurisdiction up to the top of significant bank cuts or to the outside of any riparian vegetation associated with a watercourse. This applies to any channel modifications that

would be required to meet drainage, transportation, or flood control objectives of a project. Activities that have the potential to affect jurisdictional areas can be authorized through issuance of a Streambed Alteration Agreement. The Streambed Alteration Agreement specifies conditions and mitigation measures that will minimize impacts to riparian resources from proposed actions.

#### **5.2.4.5 Fish and Game Code Section 3503**

This code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.

#### **5.2.4.6 Fish and Game Code Section 3503.5**

This code protects all birds of prey and their eggs and nests.

#### **5.2.4.7 Fish and Game Code Section 3511**

This code identifies bird species, primarily raptors that are “fully protected.” Fully protected birds may not be taken or possessed, except under specific permit requirements.

#### **5.2.4.8 Fish and Game Code Section 3513**

This code makes it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

#### **5.2.4.9 Fish and Game Code Sections 4700, 5050, and 5515**

These codes list mammal, amphibian, and reptile species that are fully protected in California.

#### **5.2.4.10 California Food and Agriculture Code 80001 et seq.**

This code allows removal of certain non-listed desert plants under permits issued by the county agricultural commissioner or sheriff.

#### **5.2.4.11 Title 14, California Code of Regulations, Sections 670.2 and 670.5**

This code lists animals designated as threatened or endangered in California. California species of special concern (CSC) is a category conferred by CDFG on those species that are indicators of regional habitat changes or are considered potential future protected species. These species do not have any special legal status, but are intended by CDFG for use as a management tool to take these species into special consideration when decisions are made concerning the future of any land parcel.

#### **5.2.4.12 Porter-Cologne Act**

Pursuant to California's Porter-Cologne Water Quality Control Act, the state regional water quality control boards (RWCQB) regulate the “discharge of waste” to “waters of the state”. All parties proposing to discharge waste that could affect waters of the state must file a waste discharge report with the appropriate regional board. The RWQCB will then respond to the report of waste discharge by issuing waste discharge requirements (WDRs) or by waiving WDRs (with or without conditions) for that proposed discharge. Both of the terms

“discharge of waste” and “waters of the state” are broadly defined in Porter-Cologne, such that discharges of waste include fill, any material resulting from human activity, or any other “discharge” that may directly or indirectly impact “waters of the state”.

## 5.2.5 Local and Other Jurisdiction LORS

### 5.2.5.1 San Bernardino County General Plan

The Conservation/Open Space Element of the County General Plan (County of San Bernardino, 2007) contains specific objectives to preserve water quality and open space that have benefits to biological resources. It also contains specific policies and goals for protecting areas of sensitive plant, soils and wildlife habitat and for assuring compatibility between natural areas and development. Applicant has been informed by San Bernardino County that the County does not have jurisdiction over BLM-managed land.

### 5.2.5.2 Clark County Conservation of Public Lands and Natural Resources Act of 2002

Passage of the Clark County Conservation of Public Lands and Natural Resources Act of 2002 by the United States Senate (Senate Bill 2612) included measures that are applicable to the Ivanpah Valley. The bill addressed the management of public lands along the I-15 corridor from southern Las Vegas to the Nevada/California State Line and included the establishment of a 2,640-foot wide corridor “... between the Las Vegas Valley and the proposed Ivanpah Valley Airport for the placement, on a non-exclusive basis, of utilities and transportation.” Lands that were transferred to Clark County for development of the Ivanpah Airport can be subsequently sold, leased, or otherwise conveyed (subject to limitations) by Clark County to a third party. The bill was signed into law by President George W. Bush during November 2002. The proposed Ivanpah SEGS project site does not fall within the lands addressed by SB 2612.

## 5.2.6 Affected Environment

This section describes the biological conditions of the proposed site, beginning with a regional overview, the vegetation types and habitat present in the project area, invasive plants species that are known to or potentially could occur, a description of wildlife typical to the area, and a discussion of specific special-status species known to occur in the general region (Zeiner et al., 1990a-c; California Natural Diversity Data Base [CNDDB], 2007). Methods employed during the surveys are summarized in Section 5.2.4. Results of the surveys are described in Section 5.2.5.

### 5.2.6.1 Regional Overview

The project area is within land managed by BLM and located in San Bernardino County, California, about 3.1 miles southwest of the Nevada border. The project is located about 0.8 miles northwest of I-15. Biogeographically and climatically, the project area lies within the Mojave Desert. The project area lies on an alluvial fan, or bajada, that extends eastward from the Clark Mountains to Ivanpah Dry Lake. The alluvial fan topography slopes very gradually (3 to 5 percent grade) to the east and southeast from a high elevation of about 3,150 feet in the northwest corner to about 2,850 feet in the southeast corner. The alluvial fan is dissected by many ephemeral wash drainage features. Most are small (active channels 1 to 3 feet wide), but a few are larger, with bank-to-bank widths of more than 50 feet and active

channels 5-15 or more feet wide. Drainage from the project area ultimately flows roughly eastward, ultimately reaching Ivanpah Dry Lake.

The predominant vegetation, Mojave Creosote Bush Scrub, is typical of the arid Mojave Desert region, and supports a number of shrub and succulent species. Vegetation types present within the project area are described in the Habitat and Vegetation Communities Section, below.

The Primm Valley Golf Club is a golf course located immediately east of the project area. There are no residential units associated with the golf course. The closest community is the town of Primm on the Nevada side of the state line. A retail and casino center along the I-15 corridor, with only a few residential facilities, is located about 4.5 miles northeast of the project area. The town of Jean, Nevada is located approximately 15 miles north of Primm along I-15. The southern outskirts of greater Las Vegas are about 32 linear miles north-northeast of the project area. The site, which is on land administered by the BLM Needles Resource Area Office, is not identified as a protected area or a BLM area of critical environmental concern (ACEC).

#### 5.2.6.2 Habitat and Vegetation Communities

Mojave Creosote Bush Scrub is the predominant vegetation type observed within the project site. This type corresponds to the Holland type of the same name (Holland, 1986) and may correspond to one or more of the Creosote Bush, Creosote Bush-White Bursage, or Black Bush series of *A Manual of California Vegetation* (Sawyer and Keeler-Wolf, 1995). According to Holland, Mojave Creosote Bush Scrub is composed of widely spaced evergreen and drought-deciduous shrubs, cacti and yucca, from 1 to 9 feet in height. Creosote bush (*Larrea tridentata*) is the dominant species and the indicator species for this vegetation type. Burrobush (*Ambrosia dumosa*, sometimes called white bursage), cheesebush (*Hymenoclea salsola*), Nevada ephedra (*Ephedra nevadensis*), and Mojave yucca (*Yucca schidigera*) are common associates throughout the range of this type (Holland, 1986).

The Mojave Creosote Bush Scrub habitat that supports high densities of barrel cactus (*Echinocactus polycephalus* and *Ferocactus cylindraceus* var. *lecontei*) and occurs on limestone or limestone-influenced areas is recognized by the CNDDDB as a natural community type: the Creosote Bush – White Bursage – Barrel Cactus (*Larrea-tridentate-Ambrosia dumosa-Echinocactus polycephalus* – \*33.140.33) plant community (Pers. Comm, Keeler-Wolf 2007; CNDDDB 2003).

Four subtypes of Mojave Creosote Bush Scrub were also identified in the project area but these were very difficult to discern in the field and were not mapped. These Creosote Bush Scrub Subtypes are: (1) Larrea-Ambrosia Scrub; (2) Larrea mixed Scrub; (3) Larrea Scrub; and (4) Limestone-Associated Type of Larrea Scrub. In addition, Mojave Yucca – Nevada Ephedra Scrub and Mojave Wash Scrub also occur. The predominant subtype of Mojave Creosote Bush Scrub vegetation throughout the project area is the Larrea-Ambrosia subtype of Creosote Bush Scrub. Limestone features are vegetated by the limestone-associated Larrea scrub subtype. Many small to medium ephemeral washes are associated with increased densities of cheesebush, and the larger ephemeral wash drainage features are vegetated with Mojave Wash Scrub. Figure 5.2-1 shows the vegetation types present within the project area, by project feature. Table 5.2-2 lists the vegetation types observed within the

project site. A list of all plants observed during the surveys is provided in Table 5.2-3. Representative photographs of vegetation observed within the project area are included in Appendix 5.2A. Detailed vegetation type descriptions, including descriptions of the four Mojave Creosote Bush Scrub subtypes, are provided in Appendix 5.2B. CNDDDB data forms for special-status plants observed are included in Appendix 5.2C.

#### 5.2.6.2.1 Invasive Weeds

Several invasive weeds are known to occur in the project vicinity. A list of potentially occurring invasive species is provided in Table 5.2-4. The weeds of highest concern in the general area include Sahara mustard (*Brassica tournefortii*), saltcedar (*Tamarix ramosissima*), red brome (*Bromus madritensis* ssp. *rubens*), and filaree (*Erodium* sp.), but other weeds of concern are also presented in Table 5.2-4 (Pers. Comm., Colin Grant and Charles Sullivan, 2007).

#### 5.2.6.2.2 Wetlands and Waters

The project area is located in the Ivanpah hydrologic unit of the South Lahontan Watershed, which includes approximately 278,486 acres in the Ivanpah and Pahrump Valleys of California and Nevada (BIOS, 2007). In this area, all drainage is internal with the rapid runoff from mountains and alluvial fans collecting in closed basins in the Ivanpah Valley. Streams, washes and playas are dry most of the year, with surface water only present in response to storm events. Ivanpah Lake is located approximately 2 miles east and down slope of the project area. The extensive dry lake bed covers approximately 35 square miles and is located in California adjacent to the California/Nevada border. There are two mapped springs, Whisky Spring and Ivanpah Spring, located approximately 1.6 miles west of the proposed project site in the foothills of the Clark Mountains.

The project area is located on a broad bajada that extends from the base of the Clark Mountains to the western shoreline of Ivanpah Lake. Numerous ephemeral washes occur throughout the broad, coalescing, alluvial fans that convey storm water runoff from the mountains towards the closed Lake basin. These ephemeral drainages range in size from small (less than 4 feet wide) weakly expressed erosional channels to relatively large, well defined features. The vegetation found adjacent to and within the drainages is described in more detail in the vegetation section of this report. No other wetlands or waters were identified in the project area.

#### 5.2.6.3 Wildlife Species Observed or Expected to Occur

The project area is considered to have approximately equivalent habitat resource values as those habitats of a similar type in the general area, and therefore, about the same potential to support various wildlife species. As such, it is not expected that there are any wildlife species that would occupy the project site preferentially to the adjacent areas.

Characteristic common wildlife species that were observed, or are expected at the site, include side-blotched lizard (*Uta stansburiana*), desert iguana (*Dipsosaurus dorsalis*), long-nosed leopard lizard (*Gambelia wislizenii*), western whiptail (*Cnemidophorus tigris*), zebra-tailed lizard (*Callisaurus draconoides*), common collared lizard (*Crotaphytus collaris*), sidewinder (*Crotalus cerastes*), gopher snake (*Pituophis melanoleucus*), Say's phoebe (*Sayornis saya*), black-throated sparrow (*Amphispiza bilineata*), white-crowned sparrow (*Zonotrichia leucophrys*), sage sparrow (*Amphispiza belli*), blue-gray gnatcatcher (*Poliophtila caerulea*), cactus wren (*Campylorhynchus brunneicapillus*), Verdin (*Auriparus flaviceps*), western kingbird

(*Tyrannus verticalis*), sage thrasher (*Oreoscoptes montanus*), house finch (*Carpodacus mexicanus*), common raven (*Corvus corax*), lesser nighthawk (*Chordeiles acutipennis*), common ground-dove (*Columbina passerine*), mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), Audubon's cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), whitetail antelope squirrel (*Ammospermophilus leucurus*), desert kit fox (*Vulpes macrotis*), feral burro (*Equus asinus*), and coyote (*Canis latrans*).

There are no species of fish or amphibians that are expected to be found within or in the vicinity of the project area. Field surveys, habitat evaluations, and aerial photographs suggest that the site and proposed linear project features are not located in important sensitive wildlife habitats, specifically because the project site is not located in, or adjacent to, USFWS designated critical habitat, a migratory pathway, a wildlife corridor, or a nursery site. A complete list of all wildlife species observed in, or adjacent to, the project area is presented in Table 5.2-5.

## 5.2.7 Methods

Methods employed during reconnaissance-level and species-specific protocol surveys for vegetation, invasive weeds, rare plants, and special-status wildlife species are described in the following sections. All field surveys were aided by aerial photographs (aerials), topographical maps (topos), submeter Global Positioning System (GPS) units with background files showing the project features, and a Geographic Information System (GIS). Transect datafiles were generated using a GIS and were uploaded into the GPS units so that surveyors could clearly identify and walk along each transect in the field. The aerials and topos were used to help orienteer, identify, and ground truth landmarks and other findings, and map field data. The GPS units were used to navigate and maintain transect integrity. Additionally, data dictionaries with pull-down menus were loaded onto the units to standardize field data collection. The field data was downloaded from the units onto the project GIS. Data layers were created to map the biological resources. Photographs were also taken to document biological resources at the project site.

### 5.2.7.1 Vegetation Characterization Methods

Vegetation within the project site was classified using Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California as a guide and primary reference (Holland, 1986). The equivalent vegetation series from A Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995) was provided when possible.

### 5.2.7.2 Invasive Weed Assessment and Survey Methods

The BLM defines a noxious weed as: "a plant that interferes with management objectives for a given area of land at a given point in time". Invasive weeds are defined for this report as species of non-native plants that are included on the weed lists of the California Department of Food and Agriculture (CDFA) (2007), the California Invasive Plant Council (Cal-IPC 2006), or those weeds of special concern identified by BLM. The Mojave Weed Management Plan website was also consulted to assemble a list of target noxious weeds to include in surveys. A list of invasive species that potentially could occur in the project site is provided in Table 5.2-4.

Invasive weeds were searched for during all phases of the field surveys. During the project site reconnaissance in March, when all plants observed were initially identified, special attention was given to detecting and identifying non-native invasive plant species. During protocol surveys from April to June, all surveyors noted any plant species with which they were not familiar, and took samples, which were identified by the project's lead botanists, in part to determine if these species were invasive weeds. The same procedure was employed in June during detailed reconnaissance surveys of the one-mile buffer.

#### **5.2.7.3 Wetland and Other Waters Delineation Methods**

Aerial photographs and the Ivanpah Lake United States Geological Survey 7.5-Minute Quadrangle Map were used to identify potential wetland and water resources in the project area. A site reconnaissance survey and preliminary assessment of water features was conducted on March 29 and 30, 2007. The preliminary data review and site reconnaissance survey identified numerous west to east trending ephemeral washes throughout the project area. Given the size of the study area and the myriad of features present, the characterization and mapping of these drainages was accomplished by a combination of field surveys and mapping using high resolution aerial photographs. Prior to field surveys, this proposed methodology was discussed with USACE regulatory staff from the Los Angeles District (Pers. Comm. Shannon Pankratz, 2007).

The formal wetland delineation field surveys were conducted from April 16 through 20, and May 21 through 24, 2007. The total survey area delineated was approximately 4,272 acres, and included the proposed disturbance areas as well as a 1,000-foot buffer area for each of the three project sites, access roads, and linear utility corridors. Linear transects perpendicular to the ephemeral drainages (north-south orientation) were established approximately every 1,000 feet. Pedestrian surveys were then conducted along each transect and data was recorded at each point where an ephemeral wash intersected the transect line.

The location of each crossing was recorded using a Trimble® Geo-XT global positioning device and general characteristic of the wash, including average channel width, evidence of flow, and general vegetation was noted. Field data was then incorporated into a GIS. Data points collected along the transect lines were then plotted on recent aerial photographs, with 2-foot resolution, and the drainage features within the survey area were manually digitized using the field data as reference locations. The area 1-mile out from the site was also evaluated for the presence of wetlands and waters and for possible indirect effects to waters adjacent to the project areas.

#### **5.2.7.4 Special-Status Species Assessment and Survey Methods**

Biological resources evaluated for project impacts included special-status and common plant and wildlife species, plant communities/wildlife habitat, and wetlands within the temporary and permanent project impact locations. In addition, a reconnaissance-level survey was conducted in the one-mile buffer to determine if sensitive habitats occur and to assess the likelihood of special-status species occurrence in this area.

Lists of special-status plant and animal species was compiled for the project area based upon the following references: the CNDDDB (CNDDDB, 2007); California Native Plant Society's (CNPS) Electronic Inventory (Skinner et al., 1994); informal consultations with agency personnel including USFWS, BLM, and CDFG; local experts; and project-specific



onsite field surveys. These comprehensive lists of special-status species are provided in Tables 5.2-6 and 5.3-7. The lists include species listed as threatened or endangered that have special requirements under FESA (USFWS, 1970) and CESA (CDFG, 2003) and other non-listed special-status species that could become listed in the future. The tables also include the habitat types that may support these species in the project area.

The biological surveys adhered to protocols and guidelines by the USACE, USFWS, CDFG, CEC, and CNPS. Additionally, the survey methodology was coordinated with the USACE, USFWS, BLM, CDFG, and CEC. These surveys were performed for the access routes, three sites, and utility corridors. Special-status plant and wildlife species surveys included the gas line corridor out to 300 and 1,000 feet on each side of the centerline, respectively. Full coverage surveys were performed within the three phases and a one mile wide buffer was surveyed outside each phase boundary. Resumes of those performing the surveys are provided in Appendix 5.2D. Guidance was provided by the CEC regarding the one mile wide survey buffer.

Tables 5.2-6 and 5.2-7 present a list of the special-status species that were evaluated as potentially occurring in the project area. Table 5.2-7 also includes special-status wildlife species whose habitat(s) and/or known distribution are present in the project area and were evaluated for potential impacts from construction, operations, and maintenance.

The reference information is based on known occurrences, historical records, or the presence of suitable habitat for any given life stage of a particular species. The known locations of special-status species identified in the CNDDDB records within a 10-mile range of the project area are shown on Figure 5.2-2.

#### 5.2.7.4.1 Special-Status Plants

The potential for special-status species occurrence within the project area was assessed by researching the special-status plant species with potential to be found within the project site, compiling information on their conservation status, distributions, blooming times, habitat characteristics, and known presence in the project region, including nearest known locations. Several known rare plant occurrences were also searched for in the field and viewed to evaluate the potential for special-status species occurrence and to familiarize the surveyors with characteristics necessary for the correct identification of the species. The assessment was conducted as follows:

A plant was considered to be of special-status if it met one or more of the following criteria:

- Federally- or state-listed, proposed, or candidate for listing, as rare, threatened or endangered (USFWS, 1996b; CNDDDB, 2007a); or
- Special Plant as defined by the CNDDDB (CNDDDB, 2007a); or
- Designated by the California Native Plant Society in its Inventory of Rare and Endangered Plants of California (CNPS, 2001; 2007); or
- Designated by the BLM as a sensitive plant on the Barstow and Needles field office lists (BLM, 2004).

A species was determined to have potential to occur within the project site if its known or expected geographic range includes the project site or the vicinity of the project site, and if its known or expected habitat is found within or near the project site.

A preliminary list of potentially occurring special-status plants was compiled from the BLM Barstow and Needles field office lists of sensitive plants (BLM, 2004), from the Nevada Natural Heritage Program special-status plant data for the Roach and State Line Pass 7.5' U.S. Geological Survey (USGS) quadrangles, and by conducting 8-quadrangle searches of the CNDDDB RareFind3 database (CNDDDB, 2007b) and the CNPS on-line Inventory (CNPS, 2007). The project is located within the Ivanpah Lake 7.5' USGS quadrangle. The Ivanpah Lake, State Line Pass, Mesquite Lake, Clark Mountain, Mescal Range, Mineral Hill, Nipton, and Desert 7.5' USGS quadrangles were included in the 8-quadrangle search. The preliminary list was revised after reviewing habitat and distribution information from the following primary sources:

- A Flora of the Higher Ranges and The Kelso Dunes of the Eastern Mojave Desert in California (Thorne et al., 1981),
- Jepson Desert Manual (Baldwin et al., 2002),
- CNPS on-line Inventory (CNPS, 2007),
- CalFlora on-line database (CalFlora, 2007),
- Cacti of the United States and Canada (Benson, 1982).

#### *Reconnaissance Surveys and Reference Site Visits*

A reconnaissance survey and some reference site visits occurred between March 28 and March 30, 2007. Additional reference site visits were made on April 16 through 18, and on June 10, 2007. During early reconnaissance surveys (March 28 through 30), the project site was accessed by vehicle and on foot from existing roads, habitat conditions within the project site were assessed, and a preliminary classification of the vegetation types was developed. From observations made during the reconnaissance survey, it was apparent that rainfall levels had not been adequate for any significant growth of annual species, and that even late rains would not change this. In consultation with the BLM and the CEC, it was determined that special-status plant surveys in 2007 would focus on shrubs and perennials, since these can usually be detected and identified in dry years. It was further decided that the annuals from Table 5.2-6 most likely to occur in the project site would be identified, and that pre-construction surveys in 2008 would be proposed as a possible means of determining if annual special-status plant species occur in the project area.

Based on habitat conditions and vegetation observed at the project site during reconnaissance surveys, and known ranges and habitat preferences of potentially occurring special-status plants, a sub-group of species from Table 5.2-6 was selected that was deemed most likely to occur at the project site. These species include: desert pincushion (*Coryphantha chlorantha*), viviparous foxtail cactus (*Coryphantha vivipara* var. *rosea*), white-margined beardtongue (*Penstemon albomarginatus*), and rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*). Special focus was directed to learning the habitat preferences and field identification features of these species, including characters that could be used in a dry year.

Several reference populations were searched for and viewed in preparation for the field surveys. These reference sites and special-status plants observed are listed below.

***Reference Sites Visited for the Following Special-Status Plant Species:***

- Clark Mountain agave (*Agave utahensis* var. *nevadensis*; CNPS, 4.2): Rosettes of leaves and the remains of flower stalks from the previous growing season were observed in two populations in the Clark Mountain Range. A population of more than 300 plants was observed on a gray limestone ridge 2.1 miles east of Keany Pass on March 30, 2007, and a population of more than 100 plants was observed on limestone slopes below the Umberci Mine on April 16, 2007.
- White bear poppy (*Arctomecon merriamii*; CNPS, 2.2): On March 30, 2007, this species was searched for but was not found at the location of CNDDDB occurrence #3, about 1 mile southeast of the Umberci Mine (CNDDDB, 2007b). Three plants were previously reported here, but either the species was not detectable in a dry year (although dry leaves from the previous year are usually detectable) or the area searched was not the exact location where the plants were previously found.
- Desert pincushion (*Coryphantha chlorantha*; CNPS, 2.2): From 1 to 11 vegetative individuals were found at several sites, including on the limestone slopes below the Umberci Mine, and along the powerline corridor west of Keany Pass on March 30 and April 16, 2007.
- Viviparous foxtail cactus (*Coryphantha vivipara* var. *rosea*; CNPS, 2.2): This taxon was searched for at a site near Ivanpah Springs, at the east edge of the Clark Mountain Range, about 2.4 miles west of Ivanpah 3, on March 30, 2007. No plants were found of this taxon, although one individual of desert pincushion was found. This site is CNDDDB occurrence #6 (CNDDDB, 2007b).
- Gilman's cymopterus (*Cymopterus gilmanii*; CNPS, 2.3): A group of 24 plants, four of which were in bud, were observed in a rocky limestone wash and on the adjacent lower slopes at the south edge of low hills of the Clark Mountain Range, about 0.8 mile southeast of the Umberci Mine, on March 30, 2007.
- Naked-stemmed daisy (*Enceliopsis nudicaulis* ssp. *nudicaulis*; CNPS, 4.3): More than 300 individuals, of which 5 percent were in flower, were observed in a rocky limestone wash and on the adjacent lower slopes at the south edge of low hills of the northeastern extension of the Clark Mountain Range, about 0.8 mile southeast of the Umberci Mine, on March 30, 2007.
- Utah mortonia (*Mortonia utahensis*; CNPS, 4.3): Several large populations (300 to 725 individuals) were observed in vegetative condition, including one in a rocky limestone wash and on the adjacent lower slopes at the south edge of low hills of the northeastern extension of the Clark Mountain Range, about 0.8 mile southeast of the Umberci Mine, on March 30, 2007.
- White-margined beardtongue (*Penstemon albomarginatus*; CNPS, 1B.2): This species was searched for on June 10, 2007, but was not found. The area searched included several sites along a powerline corridor east of the railroad tracks near Roach Dry Lake in Ivanpah Valley, Clark County, Nevada, about 5 miles northeast of the project site. This

site has been mapped by the Nevada Heritage Program as population 2512. Several sites where the plant was found in previous years were searched; however, the area was very dry and it is likely that the plants did not grow enough to be observable in 2007.

- Rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*; CNPS, 2.3): This taxon was searched for in several locations with suitable habitat in the eastern section of the Clark Mountain Range, within 3 miles of the project site, including one location along the utility corridor 2 miles east of Keany Pass where it has been reported as CNDDDB occurrence #1 (CNDDDB, 2007b). In this area, rosy two-toned beardtongue co-occurs with Palmer's beardtongue (*Penstemon palmeri*), a common and widespread species, and hybridization between the two has been reported (CNDDDB, 2007b). Flowers are required to distinguish between these two taxa. The leaves and stems are very similar in both taxa, and cannot be used to distinguish one from the other. All of the flowering individuals that were observed during reference site visits were identified as Palmer's beardtongue. The identity of non-flowering individuals could not be determined. Although no individuals of rosy two-toned beardtongue were found during reference site visits, it is likely to occur in the area, based on previous reports (CNDDDB, 2007b).
- Bee-hive cactus (*Sclerocactus johnsonii*; CNPS, 2.2): The site visited is the only reported San Bernardino County location for this species, which is CNDDDB occurrence # 9 (CNDDDB, 2007b). This site is along the utility corridor just north of the project site, at the east edge of the Clark Mountain Range, about 2.4 miles northwest of Ivanpah 3. No plants were found during a brief search. This small population of four plants may have been extirpated by pipeline construction (CNDDDB, 2007b).
- Rusby's desert mallow (*Sphaeralcea rusbyi* ssp. *eremicola*; CNPS, 1B.2): Four individuals, including one flowering, were located in the Clark Mountain Range, just west of Keany Pass, along the utility corridor, on March 30, 2007. This is CNDDDB occurrence # 11 (CNDDDB, 2007b). About 10 plants in early flowering condition were observed at Keany Pass on April 16, 2007.

Information obtained during the literature review and reconnaissance field visits was used to create Table 5.2-6, which summarizes information on special-status plants with potential to occur within the project site. Information on flowering time, status, habitat preferences, geographic distribution, elevation range, and known locations in the vicinity of the project site was researched prior to the initiation of the field surveys conducted in 2007. This information was compiled from the sources listed above, and other sources (Parfitt, 1980; Pinkava, 1996).

Appendix 5.2E lists special-status plants that were considered for inclusion in Table 5.2-6 because their geographic range includes the project site or its vicinity, but were rejected because their known or expected habitats are not found within or near the project site.

Information from reconnaissance-level and protocol field surveys was used to guide the final design of the site features. For example, a sensitive limestone hill west of Ivanpah 3 was noted as having a high potential to support rare plant occurrence and the project was then modified to avoid both this feature and the metamorphic hill located northeast of Ivanpah 1 (Figure 5.2-1).

#### 5.2.7.4.2 Rare Plant Protocol Survey Methods

Protocol-level surveys for special-status plants were floristic in nature and followed, to the degree feasible in a very dry year, the U.S. Fish and Wildlife Service's (USFWS) Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed Plants (USFWS Guidelines) (USFWS, 1996a). Surveys conducted for this project also followed, to the degree feasible, the recommendations of the botanical survey guidelines of the CDFG (CDFG, 2000), and those of the CNPS (CNPS, 2001).

The goal of the protocol-level surveys was to census, map, photograph, and record habitat data for every special-status plant encountered. Protocol-level surveys were conducted throughout each of the sites where project features are proposed, including within a buffer of designated width around each site. The sites, associated project elements, and survey buffers included in the rare plant surveys are shown in Figure 5.2-3. The dates rare plant surveys were conducted is presented in Table 5.2-8.

All surveyors received specialized onsite training from the project's supervising botanist Mark Bagley or from project assistant botanist Ann Howald. Surveyors were taught to recognize all of the common shrubs and cacti using characters, mainly vegetative, that were evident during a very dry year. Surveyors were taught to recognize the vegetation types of the project site. Surveyors were shown examples of the most commonly encountered special-status plant, desert pincushion, in its natural habitat. Surveyors with limited desert experience worked closely with the project's lead botanists until they had developed familiarity with the flora. One GPS technician who is not a biologist assisted a survey team for several days by walking transect lines and taking data. He was accompanied by a biologist surveyor who walked the same transect line and searched for special-status plants.

Teams of two to seven surveyors walked transects spaced at 50-foot intervals. This narrow spacing was selected to permit detection of small, cryptically colored special-status plants, which were expected to be scarce and patchily distributed on the alluvial fan. Survey team leaders carried paper maps of each project feature, imprinted with numbered transect lines with 100-foot spacing. For most project features, the transect lines were oriented in a north-south direction, perpendicular to the drainage features. The transects shown on the paper maps corresponded to images in background files on the Trimble GeoXT and GeoXH GPS units that were used to navigate and take data in the field. Survey teams lined up so that surveyors with GPS units walked the transect lines shown on the background files, which were spaced 100-feet apart, and surveyors without GPS units walked between them, visually spacing themselves 50 feet from the GPS-using surveyors, so that GPS-using surveyors alternated with non-GPS-using surveyors. Surveyors searched for special-status plants by scanning the ground 25 feet to either side of their transect line and frequently turning to look behind them to search for special-status plants tucked into the base of shrubs (as many cacti were), as the survey team walked across the landscape. Survey team members stayed more or less together while walking each transect.

Each time a living special-status plant was encountered, it was mapped with the Trimble GeoXT or GeoXH GPS units and habitat data was recorded on the GPS units, and on CNDDDB field survey forms (Appendix 5.2C) or in the field notes of the survey team leader. Mature barrel cactus species were also mapped using GPS. Habitat data included: scientific name, number of individuals, phenology (vegetative, in bud, in flower, old flowers, in fruit), substrate, vegetation type, associated species, and disturbance condition.

Each special-status plant was photographed in close-up view, and habitat photos were taken for most individuals. While data was being taken, the other survey team members completed intensive surveys extending to 100 feet in all directions from the plant being recorded. Intensive surveys consisted of walking transects at 5- to 10-foot intervals. Additional special-status plants were encountered about 25 percent of the time during intensive surveys. The mapping and data collection procedures were repeated for each new individual found during intensive surveys. Additional intensive surveys were conducted when new individuals were found. Rooted but dead individuals of desert pincushion were not mapped or recorded, but intensive surveys were conducted in the vicinity.

#### ***Reconnaissance-Level Survey of the One-Mile Buffer***

Reconnaissance surveys within the one-mile buffer were conducted to classify vegetation types and to assess the likelihood of special-status plant occurrence. Surveys within the one-mile buffer were completed on June 7, 2007, by six teams of two surveyors, on June 8, 2007, by five teams of two surveyors, and on June 9, 2007, by one team of two surveyors. Surveyors used high-resolution aerial photographs (scale = 1": 500') to locate and access by vehicle and on foot sections of the one-mile buffer that they were assigned to cover. Within their pre-assigned sections, each team conducted meandering transects designed to investigate representative areas of typical upland habitat and major drainage features. Areas of sensitive habitat were noted and mapped and the area assessed for the likelihood of special-status plant occurrence. No protocol-level surveys were conducted within the one-mile buffer.

#### **5.2.7.4.3 Rare Plant Survey Limitations**

##### ***Low Rainfall Conditions in 2006-2007***

Rare plant surveys were conducted during an extremely dry year, and only a very few live annual plants were present in the project area due to low rainfall. Therefore, the 2007 surveys targeted only shrubs and herbaceous perennials. Two annual plants identified as having low potential to occur in Table 5.2-6, the coyote gilia (*Aliciella triodon*) and purple bird's-beak (*Cordylanthus parviflorus*), would not have been observable in a dry year so their absence cannot be concluded. Also, a few perennial bulbous plants in the lily family (Liliaceae) listed in Table 5.2-6 would also not have been detectable in a dry year (e.g., small-flowered *Androstephium* [*Androstephium breviflorum*] and crowned muilla [*Muilla coronata*]). None of these species are federally-listed (Table 5.2-6).

The potential for the occurrence of these species will be assessed by botanists with experience conducting protocol-level rare plant surveys in the desert during a preconstruction investigation. The preconstruction investigation will be conducted during the correct season (early spring). Surveys will be conducted for these species if they are determined to be warranted.

#### ***Project Design Changes***

Some small adjustments were made to a few project elements after the biological surveys were completed (e.g., the substation, administration/storage building, and slight changes were also required in the positioning of some of the roads and linears associated with these elements). The project elements requiring slight boundary modifications are all located in the southern part of the project area (Figure 5.2-3).

The likelihood that small numbers of desert pincushion and Parish club-cholla occur in reconnaissance-level survey areas (i.e., within the 1-mile buffer) in similar densities to adjacent protocol-level surveyed areas is high. Because the perennial base of *Penstemon* was observable during the 2007 surveys, and they were only found in the north part of the project area, it is not expected that species of *Penstemon* would occur in the few areas in the southern part of the project area that were not surveyed at a protocol level.

A preconstruction habitat assessment for special-status plants will be conducted in any areas within the site boundary that were not previously included in protocol-level surveys to determine if suitable habitat for special-status plants is present. If suitable special-status plant habitat is present, protocol surveys will be conducted. Preconstruction surveys are described in Section 5.2.8, Mitigation Measures.

#### 5.2.7.4.4 Special-Status Wildlife Species

##### *Pre-field Investigation*

Information acquired from the CNDDB, BLM, USFWS, CDFG, and other sources resulted in a list of special-status wildlife species whose occurrence was previously recorded or observed during the biological surveys at, or adjacent to, the project site (Table 5.2-7). Their potential for occurrence is dependent on available suitable habitat on, or adjacent to, the project site.

Several special-status species have no record of occurring in, or adjacent to, the project area, have no suitable habitat present in the vicinity, and were not observed during the biological field surveys. Therefore, the following special-status species were removed from further consideration: the Amargosa vole (*Microtus californicus scirpensis*) (FE, SE), which is found only within the Amargosa River drainage in Inyo County in the vicinity of Tecopa Hot Springs and Tecopa; the Mohave ground squirrel (*Spermophilus mohavensis*) (ST), which is restricted to the northwestern Mojave Desert (USFWS, 1995); and the banded Gila monster (*Heloderma suspectum cinctum*) (CSC, BLM SS), which occurs from extreme southwest Utah to southern Sonora and northern Sinaloa, and extreme southwest New Mexico to southern Nevada, and partially into California. Additionally, the bald eagle (*Haliaeetus leucocephalus*) (SE) is not expected to occur within the vicinity of the project boundary because habitat necessary to support this species (namely, major water features capable of supporting adequate fish resources) is not present within the project area.

Species that are federally or State listed as threatened or endangered, candidates for listing, species of special-concern, or sensitive by BLM are listed in Table 5.2-7. A total of 17 special-status wildlife species, including 1-reptile, 13-bird, and 3-mammal species, were identified during the literature search and biological field surveys as known to be present or potentially occurring within or in the vicinity of the project area. Sensitive biological resources that may require additional surveys and project analysis include desert tortoise, American badger, roosting bats, and nesting birds, including the burrowing owl. The results of these surveys will provide additional guidance for final placement of project features and appropriate avoidance and/or minimization measures. The special-status species status; natural history; threats; and evaluation for having a low, moderate, or high potential of occurrence at the project site are discussed in further detail in Table 5.2-7 and in the following report sections.

*Desert Tortoise (FT, ST)*

The desert tortoise was listed as federally threatened on April 2, 1990 (USFWS, 1990a). Critical habitat was designated on February 8, 1994 (USFWS, 1994a). The Desert Tortoise Recovery Plan was released on June 28, 1994 (USFWS, 1994b). The desert tortoise was listed as threatened by the State in 1989.

The decline in the desert tortoise population is primarily due to habitat loss, degradation, and fragmentation resulting from increased human population and urbanization in the desert and arid regions of the southwestern United States. The increase in urbanization, collection of tortoises for pets, overgrazing, landfills, subsidized predation, highway mortality, vandalism, agriculture, fire, drought, and off-road vehicle use have all contributed to the decline of the tortoise in the wild. Another important reason for the tortoise decline in the western Mojave Desert is the introduction of an upper respiratory tract disease into many of the wild populations (USFWS, 1990a; 1994b).

The desert tortoise is a large herbivorous terrestrial reptile. It has a high-domed shell that can reach a length of 36 centimeters (14 inches). The animal has stocky, elephant-like limbs and a short tail. The carapace (upper shell) is brown, and the plastron (lower shell) is yellow (both exhibiting prominent growth lines). Adult males can be distinguished from females by the concavity toward the rear of their plastron. Adult males also have larger chin glands, and a longer tail and gular horn than females (Stebbins, 1985).

The adult desert tortoise is generally active from mid-March or April to November and, during the winter months, is dormant in underground burrows (Luckenbach, 1982). Desert tortoises will congregate in winter dens during colder weather, and then spread out to nearby areas during moderate weather in the spring and fall and retreat into short individual burrows or under shrubs during more extreme heat in summer (Woodbury and Hardy, 1940). During the summer active period, desert tortoises have home ranges from 12.7 to 72.1 hectares (5 to 29 acres) (O'Conner et al., 1994). During active periods, tortoises feed on a wide variety of herbaceous plants, including cactus, grasses, and annual flowering plants (USFWS, 1994b).

Desert tortoises may live beyond 80 years and have a relatively slow rate of reproduction. Sexual maturity is reached at 15 to 20 years of age. Mating generally occurs in the spring (mid-March to late-May), with nesting and egg-laying occurring from May to July (Rostral et al., 1994). The female tortoise lays her eggs in a hole approximately 7 to 10 centimeters (3 to 4 inches) deep dug near the mouth of a burrow (Woodbury and Hardy, 1948). Following egg-laying, the female covers the eggs with soil. Clutch size ranges from 2 to 14 eggs, with an average of 5 to 6 eggs (Luckenbach, 1982). Desert tortoise eggs typically hatch from August through October. These hatchlings are provided a food source in the form of an egg yolk that is assimilated into the underside of the shell. This yolk sac will sustain the animal for up to 6 months. The hatchling desert tortoise will go into hibernation in the late fall but can be active on warm sunny or rainy days (Luckenbach, 1982).

The desert tortoise can be found in desert and arid regions from southern Nevada and extreme southwestern Utah to northern Sinaloa, Mexico, southwestern Arizona west to the Mojave Desert, and eastern side of the Salton Basin, California (Stebbins, 1985). The desert tortoise can be divided into two distinct races, the Mojave and Sonoran, based on morphological and genetic characteristics.



The Mojave race is associated with the Mojave Desert in California, Nevada, and Utah, as well as a portion of Arizona. This race is primarily associated with flats and bajadas (shallow slopes that lie at the base of rocky hills), with soils ranging from sand to sandy-gravel but firm enough for the tortoise to construct burrows. In California, this desert tortoise is most commonly found in association with creosote bush scrub, with inter-shrub space for growth of herbaceous plants (USFWS, 1994b).

Although the Ivanpah SEGS site is located in the southeastern portion of the NEMO Planning Area Boundary, the project area does not lie within critical habitat for the desert tortoise, nor does it lie within a recovery unit or DWMA. However, the Ivanpah critical habitat unit is located west, south, and southeast of the site. The project area lies approximately 5 miles from the nearest portion of the Ivanpah critical habitat unit, just north of the I-15 and Route 164 interchange.

The project area contains suitable habitat for the desert tortoise. However, annual herbs and forbs used as forage by this species are currently considered limited due to drought conditions.

### *Protocol-Level Desert Tortoise Surveys*

In accordance with USFWS presence/absence survey protocol for the desert tortoise (USFWS, 1990b, 1992), BEA and CH2M HILL wildlife biologists conducted pedestrian transect surveys of the project area from April 9 to June 5, 2007. The biologists' qualifications are provided in Appendix 5.2D. The USFWS desert tortoise field survey protocol (USFWS, 1992) is as follows:

- **Presence-or-Absence:** The purpose of this survey is to determine impacts of potential land disturbance activities or land management activities to the local tortoise population. This includes identifying the number and location of all tortoises and their sign that occur within the project area and if any tortoises occur in adjacent areas whose home range may overlap into the project area and thus be lost or harassed by the proposed action. The project area is defined as any area that will be cleared or partially cleared, with vehicles on or adjacent to it, temporarily or permanently used for equipment or materials storage, loading or unloading, or sites where soils/vegetation is damaged, fragmented, or disturbed (e.g., driving overland).

The entire project area is surveyed using belt transects 10 yards or 30 feet wide (100 percent coverage). In some locations, belt transects less than 30 feet wide may be appropriate. In addition, the Zone of Influence is surveyed. The Zone of Influence is defined as the area where tortoises on adjacent lands may be directly or indirectly affected by project exploration, construction, maintenance, operation, monitoring, dismantlement, enhancement, and project abandonment. At a minimum, the belt transects in the Zone of Influence are located at 100, 300, 600, 1,200, and 2,400-foot intervals from and parallel to the edge of the project boundaries. All tortoise sign (e.g., live tortoises, shell, bones, scutes, limbs, scats, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, and mineral licks) within the project area and sign located on transects within the Zone of Influence should be mapped.

The extent of the Zone of Influence is dependent on the type of habitat alteration/development and its proximity to other developments. The extent of the Zone of

Influence increases as the probability of increased use by domestic predators, potential human use in the Zone, road creation and use, littering, and waste disposal. These uses result in increased take of desert tortoises through predation, collection as pets, vandalism, road kills, and attracting predators such as ravens, coyotes, and feral dogs to the area.

Exclusive of the Zone of Influence, the total project area covers approximately 3,400 acres, or approximately 5.25 square miles. Adhering to the aforementioned USFWS protocol, a total of 1,214.6 transect (linear) miles were surveyed in the project area, including the Zone of Influence. Full coverage surveys were performed within the three sites (Ivanpah 1, 2 and, 3) and the 1,000 foot wide gas line corridor. The 100- and 300-foot Zone of Influence transects to the north of Ivanpah 3 ended up inside the site due to a shift in the project boundary after the surveys were performed. Another change in the project layout resulted in several Zone of Influence transects being shifted due to the relocation of the administration and storage building. These minor changes are not expected to substantially affect the survey results.

Beyond the protocol requirements, an additional Zone of Influence transect was conducted at an interval of 1 mile, per the request of Mr. Marc Sazaki of the CEC. This transect was modified due to natural and man-made barriers such as the Clark Mountains and I-15. Again, the truncation of this transect is not expected to substantially affect the survey results, since there is a very low potential of encountering desert tortoise on the steep slopes of the Clark Mountains or on the highly traveled I-15.

On May 11, 2007, Mr. Ray Bransfield of the USFWS Ventura Office provided consent for the desert tortoise surveys to extend beyond the standard protocol survey time period of March 25 to May 31. Discretion is allowed, as the protocol states that, "this survey time period may be extended by the Fish and Wildlife Service if tortoises on or near the project area have been observed above ground prior to March 25 or after May 31." This proved to be the case, for during the surveys conducted in the first 5 days of June (which accounted for less than 10 percent of the total mileage surveyed) biologists encountered 2 live tortoises, as well as several burrows and carcasses. A survey area map illustrating project features and transects is presented in Figure 5.2-4.

All tortoise sign (e.g., live tortoises, shell, bones, scutes, limbs, scats, burrows, pallets, tracks, egg shell fragments, courtship rings, drinking sites, and mineral licks) within the project area and along the Zone of Influence transects were recorded using handheld Trimble GeoXH GPS units. Using these units capable of sub-meter accuracy, navigation of the transects and recording of sign was extremely precise. Using these units as data collection devices enabled the biologist to directly enter standardized information into a data dictionary with pull-down menus that was based on the presence-or-absence survey form as presented in the 1992 Desert Tortoise Handbook. Since data was entered electronically, any potential for error was greatly reduced. A copy of the desert tortoise sign data collection sheet from the data dictionary is presented in Appendix 5.2F. Additionally, all data was backed-up in the field using a voice recorder and a separate Lowrance handheld GPS unit, both for redundancy and to assure the accuracy of the original data collected.

As per the USFWS protocol, all surveyors only estimated the size of all live desert tortoises encountered, and no tortoises were handled or harassed during the surveys. No burrows were inspected with a fiber optic scope and all of the surveys were conducted during

daylight hours. Appendix 5.2G details several of the precautions that were strictly adhered to during the course of all survey activity.

### **Birds**

**Western Burrowing Owl (FSC, CSC, MB).** The burrowing owl (*Athene cunicularia*) is a Federal Species of Concern (FSC) and a CSC. Additionally, it is protected under the MBTA and several CDFG codes including 3503, 3503.5, and 3513. This species is widespread throughout the western U.S., but has declined in this area and many other areas because of habitat modification, poisoning of its prey, and introduced nest predators. The burrowing owl is diurnal and usually non-migratory in this portion of its range. This species is known to establish nests within abandoned burrows from ground squirrels, kit fox, desert tortoise, and other wildlife. It is found in low densities in desert habitats, but can occur in much higher densities near agricultural lands where rodent and insect prey tend to be more abundant. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Golden Eagle (FSC, CSC, FP, BLMSS, MB, BGEPA).** The golden eagle (*Aquila chrysaetos*) is recognized as a FSC, CSC, and Fully Protected by CDFG, and a BLM Sensitive Species. This species is also offered protection under the BGEPA and MBTA. Habitat for this species is typically rolling foothills, mountain areas and desert. Golden eagles need open terrain for hunting and prefer grasslands, deserts, savannah, and early successional stages of forest and shrub habitats. This species prefers to nest in rugged, open habitats with canyons and escarpments, with overhanging ledges and cliffs and large trees used as cover. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Loggerhead Shrike (FSC, CSC, MB).** The loggerhead shrike (*Lanius ludovicianus*) is a FSC and a CSC. It is offered protection under the MBTA and CDFG code. Loggerhead shrikes are common residents and winter visitors of California foothills and lowlands. This species can be found within open habitat types, including sage scrub, non-native grasslands, chaparral, riparian, croplands, and areas characterized by open scattered trees and shrubs. Fences, posts, or other potential perches are typically present. The loggerhead shrike forages for large insects and lizards over open ground within areas of short vegetation, usually impaling prey on thorns, wire barbs, or sharp twigs to cache for later feeding. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Le Conte's Thrasher (BCC, CSC, BLMSS, MB).** The Le Conte's thrasher (*Toxostoma lecontei*) is a USFWS Bird of Conservation Concern, a CSC, and a BLM Sensitive Species. It is offered protection under the MBTA and CDFG code. This species is a desert resident that inhabits areas with sparse desert scrub, alkali desert scrub, and desert succulent scrub habitats with open desert washes. It can be found year-round throughout much of the Mojave and Colorado deserts of California. The Le Conte's thrasher population densities are among the lowest of passerine (perching) birds, estimated at less than five birds per square mile in optimal habitat. This low population density decreases the probability of their detection during field surveys. The Le Conte's thrasher feeds on seeds, insects, small lizards, and

other small vertebrates. This species requires areas with an accumulated leaf litter under most plants as cover for its mostly arthropod prey (Bureau of Land Management, Undated). A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Crissal Thrasher (BCC, CSC, MB).** The Crissal thrasher (*Toxostoma crissale*) is a USFWS Bird of Conservation Concern and a CSC. It is a non-migratory resident ranging from southern Nevada and southeastern California to western Texas and central Mexico. This species prefers habitats characterized by dense, low scrubby vegetation, such as desert and foothill scrub and riparian brush. The nest of the Crissal thrasher typically consists of an open cup of twigs, lined with finer vegetation, and placed in the middle of a dense shrub or bush. Loss of habitat to clearing for agriculture or urban and suburban development threatens some populations. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Bendire's Thrasher (BCC, CSC, BLMSS, MB).** The Bendire's Thrasher (*Toxostoma bendirei*) is a USFWS Bird of Conservation Concern, a CSC, and a BLM Sensitive Species. It is offered protection under the MBTA and CDFG code. This species is a very local spring and summer resident and breeder in flat areas of desert succulent shrub and Joshua tree habitats in Mojave Desert area. Bendire's Thrashers frequent flat desert areas with scattered stands of thorny shrubs, yucca, and cactus for cover, foraging, and nesting. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Gray-headed Junco (CSC, MB).** The gray-headed junco (*Junco hyemalis caniceps*) is a CSC. It is offered protection under the MBTA and CDFG code. The gray-headed junco is a common to abundant species, breeding and wintering in California. This species breeds in mountains and foothills throughout the state, including higher desert ranges (McCaskie et al., 1979; Garrett and Dunn, 1981). Found mostly in forests and woodlands from montane hardwood-conifer forests up through alpine dwarf-shrub habitat of the Sierra Nevada. The "gray-headed" race of the dark-eyed junco breeds locally in the White and Grapevine Mountains, and on Clark Mountain in southeastern California (McCaskie et al., 1979). A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Gray Vireo (BCC, CSC, BLMSS, MB).** The gray vireo (*Vireo vicinior*) is a USFWS Bird of Conservation Concern, a CSC, and a BLM Sensitive Species. It is offered protection under the MBTA and CDFG code. This species is an uncommon, local, summer resident in arid pinyon-juniper, juniper, and chamise-redshank chaparral habitats from 600 to 2,000 meters (2,000 to 6,500 feet) in mountains of the eastern Mojave desert, on northeastern slopes of the San Bernardino Mountains, in the San Jacinto Mountains, and on southern slopes of the Laguna Mountains. The gray vireo forages amongst shrubs and small trees, using them for cover as well. Breeders of this species frequent arid, shrub-covered slopes with sparse to moderate cover and scattered small trees, commonly junipers, pinyon pines, chamise, or other chaparral. A CNDDDB search for this species was performed prior to the wildlife

survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Hepatic Tanager (CSC, MB).** The hepatic tanager (*Piranga flava*) is a CSC. It is offered protection under the MBTA and CDFG code. This species is a neo-tropical migrant that breeds from northwestern Arizona, New Mexico, southern Nevada, southeastern California, and Texas, south to Mexico, and is found in open, mountainous pine and pine-oak forests, where it both forages and nests. The hepatic tanager is a very shy, wary species. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Vaux's Swift (CSC, MB).** The Vaux's swift (*Chaetura vauxi*) is a CSC. It is offered protection under the MBTA and CDFG code. This species breeds from southeastern Alaska and Montana to central California. Vaux's swift usually roost and nest in natural cavities with vertical entranceways, such as hollow trees. Foraging habitat is open sky over woodlands, lakes, and rivers, where flying insects are abundant. Nesting habitat for Vaux's swift consists of forest, either coniferous or mixed, but primarily old growth with snags for nesting and roosting. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Brewer's Sparrow (BCC, MB).** The Brewer's sparrow (*Spizella breweri*) is a USFWS Bird of Conservation Concern. It is offered protection under the MBTA and CDFG code. This species is a common summer resident and breeder east of the Cascade-Sierra Nevada crest in mountains and higher valleys of the Mojave Desert. In summer, Brewer's sparrow often finds cover in sagebrush in extensive stands with moderate canopy unbroken by trees, while similar shrub habitats, such as bitterbrush, are used to a lesser extent. This species breeds in treeless shrub habitats with moderate canopy, especially in sagebrush. In winter, this species is common in open desert scrub and cropland habitats of the southern Mojave and Colorado deserts, usually in areas with some herbaceous understory. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Summer Tanager (CSC, MB).** The summer tanager (*Piranga rubra*) is a CSC. It is offered protection under the MBTA and CDFG code. This species is an uncommon (formerly common) summer resident and breeder in desert riparian habitat along the lower Colorado River, also occurring very locally elsewhere in southern California deserts. Summer tanagers are also found in additional deserts and other localities during migration. This species breeds in mature, desert riparian habitat dominated by cottonwoods and willows (Grinnell and Miller, 1944; McCaskie et al., 1979, 1988; Garrett and Dunn, 1981). Cottonwoods and willows, especially older, dense stands along rivers and streams, provide nesting, feeding, and other cover. Summer tanagers are much less common now than in the 1940s, primarily because of loss and fragmentation of mature cottonwood and willow stands, especially along the Colorado River (Grinnell and Miller, 1944; Remsen, 1978). A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Virginia's Warbler (BCC, CSC, MB).** The Virginia's warbler (*Vermivora virginiae*) is a USFWS Bird of Conservation Concern and a CSC. It is offered protection under the MBTA and CDFG code. This species is a rare to uncommon, very local, summer resident along the eastern slope of the southern Sierra Nevada, and in several desert ranges. The Virginia's warbler breeds in arid, shrubby, mixed conifer, pinyon-juniper, montane chaparral, and possibly montane riparian habitats from about 2,200 to 2,800 meters (7,000 to 9,000 feet). Nesters of this species frequent arid slopes with moderate to dense stands of tall shrubs with scattered trees. Characteristic shrubs include mountain mahogany, manzanita, serviceberry, and snowberry. Characteristic trees include pinyon pine, limber pine, and white fir. Specific breeding localities in the vicinity of the project area include the Clark Mountains, and the New York Mountains (Johnson, 1976). A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

### **Mammals**

**American Badger (CSC).** The American Badger (*Taxidea taxus*) is a CSC. It was once fairly widespread throughout the open grassland habitats of California. Badgers are now an uncommon, permanent resident found throughout most of the state, with the exception of the northern North Coast area. They are most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas. Cultivated lands have been reported to provide little usable habitat for this species. They feed mainly on small mammals, especially ground squirrels, pocket gophers, rats, mice, and chipmunks. This species captures some of its prey above ground foraging on birds, eggs, reptiles, invertebrates, and carrion. Its diet will shift seasonally and yearly depending upon prey availability. This species is somewhat tolerant of human activities. Predator control with the usage of indiscriminate trapping and poisons along with habitat loss have caused extensive losses. Additionally, vehicular accidents, farming operations, and indiscriminate shootings are also causes of mortality. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Nelson's Bighorn Sheep (FSS, BLMSS).** The Nelson's bighorn sheep (*Ovis canadensis nelsoni*) desert population is recognized as a BLM Sensitive Species and a U.S. Department of Agriculture Forest Service (USFS) Sensitive Species. This species is widely distributed from the White Mountains in Mono County to the Chocolate Mountains in Imperial County. Bighorn sheep are typically found on open, rocky, steep areas used for escape cover with available water and herbaceous vegetation for forage.

A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

**Townsend's Big-eared Bat (CSC, FSS, BLMSS).** The Townsend's big-eared bat (*Corynorhinus townsendii*) is a CSC, a BLM Sensitive Species, and a USFS Sensitive Species. Townsend's big-eared bat is found throughout California, in all but subalpine and alpine habitats, and may be found at any season throughout its range. Once considered common, Townsend's big-eared bat now is considered uncommon in California. It is most abundant

in mesic habitats. This species requires caves, mines, tunnels, buildings, or other human-made structures for roosting. The Townsend's big-eared bat captures their prey in flight using echolocation, or by gleaning from foliage, with small moths being the principal food of this species. Extremely sensitive to disturbance of roosting sites, a single visit may result in the abandonment of the roost. A CNDDDB search for this species was performed prior to the wildlife survey and concurrent with the desert tortoise protocol survey, biologists documented suitable habitat and any incidental sightings or sign of this species.

## 5.2.8 Results of Biological Surveys

### 5.2.8.1 Habitat and Vegetation Communities

Three predominant vegetation types occur within the project area: Mojave Creosote Bush Scrub, Mojave Yucca – Nevada Ephedra Scrub, and Mojave Wash Scrub (Figure 5.2-1). Detailed vegetation type descriptions, including the dominant and subdominant plants observed within each plant community type, are provided in Appendix 5.2B). Several generalized vegetation distribution patterns were discernable on the Ivanpah Valley alluvial fan, within which most of the project area occurs, and they are described below.

#### 5.2.8.1.1 Higher Elevations

At higher elevations (approximately 3,000 to 3,150 ft), and especially near the bases of hills, there is higher diversity in vegetation types and subtypes, and higher diversity in shrub and cactus species, and higher density of shrubs and cacti, and higher density of Mojave yucca. Also, at higher elevations on the alluvial fan, especially to the northwest, there are more large drainage features, many with distinctive wash vegetation.

#### 5.2.8.1.2 Middle Elevations

At middle elevations (around 2,900 feet), a single vegetation subtype of Mojave Creosote Bush Scrub, *Larrea-Ambrosia* scrub, is predominant. Shrub and cactus density and species diversity, and Mojave yucca density, are all, in general, intermediate between the levels found at the higher and lower elevations of the alluvial fan.

#### 5.2.8.1.3 Lower Elevations

At lower elevations (approximately 2,700-2,850 ft), *Larrea-Ambrosia* scrub is, with the exception of a few acacia washes, the only vegetation type found. Shrub and cactus density and species diversity, and Mojave yucca density, are all low to very low, with few or no barrel cacti or Mojave yucca individuals found within some local areas.

### 5.2.8.2 Barrel Cactus and Yucca Counts

A census of two species of barrel cacti, and counts of Mojave yucca within representative transects, were also conducted. Results of these investigations are provided below. Two species of barrel cactus occur in the project area: California barrel cactus (*Ferocactus cylindraceus* var. *lecontei*) and clustered barrel cactus (*Echinocactus polycephalus*). A total of 4,636 barrel cactus were mapped within the proposed project site (Figure 5.2-5).

The number of barrel cactus observed per site element is presented in Table 5.2-9. Mojave yucca was much too prevalent to map individual yucca plants, and counts of Mojave yucca within representative belt transects were completed as a basis for estimating Mojave yucca densities. In Ivanpah 1, 2, and 3, Mojave yuccas were counted within representative 100-foot

or 200-foot wide transects. Transects were selected in areas that represented the lowest density and higher density areas in order to obtain a range of possible yuccas occurring. The Mojave yucca density ranges obtained were then proportionately extrapolated by the total area of the sites to estimate the possible range of Mojave yuccas occurring within the site.

#### 5.2.8.2.1 Creosote Bush – White Bursage – Barrel Cactus Community Type

The total number of barrel cactus observed corresponds to a density of approximately 1 to 2 mature barrel cactus per acre, with some localized areas supporting 15 mature barrel cacti per acre. Typically, barrel cactus occurs in high densities such as these on rocky foothill or mountain slopes instead of on alluvial fans. This density of mature barrel cactus on an alluvial fan is unusual (Pers. Comm., Keeler Wolf, 2007). However, results of biological surveys at the scale of the survey conducted for the SEGS project are not readily available. This plant community is recognized by the CNDDDB as a natural community type: the Creosote Bush - White Bursage - Barrel Cactus (*Larrea tridentate* *Ambrosia dumosa*-*Echinocactus polycephalus* – \*33.140.33) plant community (Pers. Comm, Todd Keeler-Wolf, 2007; CNDDDB, 2003).

The first two numbers in the element code (33) denotes the general physiognomic and physical location of the habitat and the broad habitat type category (e.g., scrub habitats). The middle numbers (140) represent the floristic vegetation alliance (as categorized by the characteristic dominant plant species). The last two numbers (also 33) denote the association (or the finest-scale category which includes the specific vegetation components that make this plant habitat unique) as described in Sawyer and Keeler-Wolf 1995). The asterisk (\*) preceding the element code indicates a vegetation series or association considered rare and worthy of consideration by CNDDDB (CDFG, 2003; Pers. Comm., Keeler-Wolf, 2007). This natural community type is endemic to the eastern Mojave region and is associated with limestone.

#### 5.2.8.2.2 Invasive Weeds

Invasive weeds were observed to be very low in abundance and diversity throughout the project area. The invasive weeds encountered during all surveys conducted for this project are listed in Table 5.2-4. A summary of invasive weed occurrence is provided below. However, growth of annuals in 2007 was nearly lacking due to dry conditions, so it is possible that invasive annuals could be more diverse, abundant, and widespread in years of normal or above average rainfall. Sahara mustard (*Brassica tournefortii*), a highly invasive annual weed in the Mustard Family that is spreading rapidly in parts of the Mojave Desert and is of concern to the BLM, was not observed during the surveys.

#### 5.2.8.2.3 Invasive Species Observed During the 2007 Surveys

- Mediterranean-grass (*Schismus* spp.), a small annual grass, was found in low abundance, patchily distributed, but widespread throughout the project area. Some plants were senesced plants from the 2007 growing season, but many were skeletons from the previous year.
- Red brome (*Bromus madritensis* ssp. *rubens*), another small annual grass, was widespread, occurring mainly as skeletons from the previous year, and typically occurred at the base of larger shrubs.



- A few individuals of London rocket (*Sisymbrium irio*), an annual in the Mustard Family (Brassicaceae), were observed in the vicinity of a well site on Colosseum Road.
- Five individuals of tamarisk (*Tamarix* sp.), a large shrub in the tamarisk family (Tamaricaceae) that invades areas with moist to wet alkaline or saline soils, were observed in the southeast section of the one-mile buffer, east of I-15.

### 5.2.8.3 Special-Status Plant Survey Results

Three special-status plant species: (1) desert pincushion, (2) Utah vine milkweed, and (3) Parish club-cholla were observed within the project site during protocol surveys. A total of 122 individuals of desert pincushion were observed in 114 mapped localities; three individuals of Utah vine milkweed were identified in three separate mapped locations; and 143 Parish club-cholla were detected and mapped in 96 separate locations.

In addition, 12 individuals of a species of beardtongue (*Penstemon* sp.) were mapped in 5 separate locations. This species could not be identified, but it could be rosy two-toned beardtongue, a special-status plant.

The distribution of special-status plants in the project area is shown in Figure 5.2-3. The number of special-status plants observed, by project feature, is presented in Table 5.2-10. Photographs of the special-status plants identified during the surveys are provided in Appendix 5.2A. Detailed descriptions of the special-status plants observed, their distribution, and conservation status are included in the following sections.

#### 5.2.8.3.1 Desert pincushion (*Coryphantha chlorantha*) CNPS 2.2

Desert pincushion is a small yellow-green to pink-flowered stem succulent in the Cactus Family (Cactaceae). The stems are typically solitary or few (occasionally up to 12), 3 to 3.5 inches in diameter and 3 to 6 inches tall (Benson 1969, 1982; Flora of North America, 2007). The flowers are straw-yellow, yellow-green, or pink, with narrowly lanceolate, mucronate petals 0.5 to 1 inch long and about 0.25 inch wide (Benson 1982). The blooming time is April to September. The fruit is about 1 inch long. The fruiting time is unknown.

*The Jepson Desert Manual* (Baldwin et al., 2002) gives the habitat of desert pincushion in California as limestone soils from about 3,000 to 7,000 feet in elevation. The CNPS on-line Inventory describes its habitat in California as Joshua tree woodland, Mojavean desert scrub and pinyon and juniper woodland, on gravelly or rocky carbonate substrates, from 150 to 4,500 feet (CNPS 2007). (The lower elevation limit is not substantiated by other sources and is probably in error.)

The scientific name *Coryphantha chlorantha* (Engelmann) Britton & Rose was first published in 1923 (Britton and Rose). The nomenclatural history of this taxon is complicated and will not be described here in full. Most recently this taxon has been classified as *Coryphantha vivipara* variety *deserti* (Munz, 1974; Benson, 1982), and as *Escobaria vivipara* variety *deserti* (Baldwin et al., 2002). In the *Flora of North America*, Volume 4 (2007), Zimmerman and Parfitt have reinstated the name *Coryphantha chlorantha*. This treatment will be followed in the second edition of *The Jepson Manual* (Parfitt, in preparation). *Coryphantha chlorantha* is the name currently used by the CNPS Inventory (2007) and the CNDDB (2007a).

### ***Distribution***

In California, desert pincushion is known from the Mojave Desert, in San Bernardino and Inyo counties (CNDDDB, 2007b); it also occurs in Nevada, Arizona, and Utah (Flora of North America 2007). Although earlier publications reported it from Riverside and Imperial counties (Benson, 1969), these records were based on misidentifications (Zimmerman, 1985). *The Jepson Desert Manual* (Baldwin et al., 2002) describes its range in California (as *Escobaria vivipara* var. *deserti*) as limited to the mountains of eastern San Bernardino County. DeDecker (1984) and York (CNDDDB, 2007c) report it from the Kingston Range in southeastern Inyo County.

Details of the distribution of desert pincushion in California are imperfectly known, likely due to survey limitations, difficulty in separating this species from other taxa in the genus *Coryphantha*, and incomplete reporting. Based on available information, desert pincushion's distribution in California is restricted to a few mountain ranges in the eastern Mojave Desert, in eastern San Bernardino County and southeastern Inyo County. The Consortium of California Herbaria (Jepson Online Interchange, 2007) lists 11 specimens of desert pincushion from California. These are all from locations in the eastern Mojave Desert, in eastern San Bernardino County. Five are from Clark Mountain or the Clark Mountain Range, one is from the Mescal Range, two are from the Ivanpah Mountains, two are from the valley between the Mescal Range and the Ivanpah Mountains, and one is from the Kingston Range (Jepson Online Interchange, 2007). It has also been reported from the Kingston Range in southeastern Inyo County (DeDecker, 1984; CNDDDB, 2007c). Clark Mountain and the Clark Mountain Range lie immediately to the west and north of the project area. The Mescal Range and the Ivanpah Mountains are south of I-15, and about five to ten miles south of the project area. The Kingston Range is about 30 miles northwest of the project area, along the border between Inyo and San Bernardino counties.

Within the area where project features are proposed, a total of 122 individuals of desert pincushion were mapped in 114 separate localities during protocol-level surveys. It is likely that this is somewhat of an undercount because desert pincushion individuals are small, cryptically colored, typically occur as isolated individuals, and often grow beneath or within larger shrubs, making them hard to locate. The distribution of desert pincushion by project feature is shown in Figure 5.2-3.

Desert pincushion was found in several different microhabitats within the project area, most commonly in Larrea-Ambrosia scrub, in gravelly to cobbly upland sites, especially in areas of desert pavement. Many individuals were found growing at the base of or within shrubs and cacti of various species, including: creosote bush, burrobrush, pima ratany, cheesebush, and pencil cactus. A few individuals were found growing in sandy substrates, among boulders, or within Mojave Wash Scrub.

### ***Conservation Status***

In October 2006, the CNPS and the CNDDDB circulated a recommendation to its regional review panel to add desert pincushion to the CNPS Inventory and to the CNDDDB's list of special plants. This recommendation was implemented in November 2006; however, the transfer of location data for this species to RareFind3, the CNDDDB's on-line and CD-based version of its database, is currently in progress (Bittman, pers. comm.). Therefore, information on the status and distribution of desert pincushion was accessed by reviewing CNDDDB's hardcopy files in-house.

Desert pincushion was included into the CNPS's Inventory as a List 2 species, meaning that it is considered rare, threatened, or endangered in California, but more common elsewhere. It has a threat extension code of .2, meaning that it is fairly endangered in California (CNPS, 2007). The CNDDDB, using the natural heritage methodology ranking system (NatureServe, 2007), has assigned desert pincushion a global rank of G2G3 and a state rank of S2.2 (CNDDDB, 2007a). A global rank of G2G3 means that throughout its global (worldwide) range, this species is known from between 6 and 80 occurrences<sup>1</sup>, 1,000 to 10,000 individuals, or 2,000 to 50,000 acres. A state rank of 2 means that within California this species is known from 6 to 20 occurrences, or 1,000 to 3,000 individuals, or 2,000 to 10,000 acres, and the threat extension of .2 means that it is considered threatened in California.

In Nevada, neither the Nevada Native Plant Society nor the Nevada Natural Heritage Program has included desert pincushion on any of its conservation status lists (NNPS, 2007; NNHP, 2007). In compiling its at-risk plant lists, the Natural Heritage Program so far has based its conservation priorities on species that are globally rare and endangered, and has not focused on plants that are rare only within the state. According to Dr. James Morefield, Natural Heritage Program Botanist, desert pincushion may merit reconsideration, now that it has been recognized as a species separate from *Coryphantha vivipara* and its global range has been ranked as G2 or G3. Its distinctive features probably make it more vulnerable to poaching than many other cacti, according to Dr. Morefield, which could qualify it for at-risk status. Although it has been frequently encountered in southern Nevada, more fieldwork in Nevada is needed to clarify its statewide abundance and distribution (Pers. Comm., Morefield, 2007).

In Arizona, the Arizona Natural Heritage Program does not include desert pincushion on its tracking list for at-risk plant species (ANHP, 2007). Marc Baker reports that he has seen it in many locations in Arizona, and that it is probably under-represented in herbaria (CNDDDB, 2007c). The Arizona Native Plant Society is in the process of developing its list of rare plants (ANPS, 2007). The Utah Division of Wildlife Resource's Inventory of Sensitive Species and Ecosystems in Utah (1998) does not include desert pincushion on any of its lists.

#### 5.2.8.3.2 Utah Vine Milkweed (*Cynanchum Utahense*) CNPS 4.3

Utah vine milkweed is a perennial herbaceous vine in the Milkweed Family (Asclepiadaceae). The plants have thread-like, bright green stems and small red and yellow flowers clustered in umbellate heads about 1-inch-wide (Baldwin et al., 2002) (Appendix 5.2-A). These small vines grow up through and entwine themselves within woody shrubs. The blooming time is April to June.

*The Jepson Desert Manual* (Baldwin et al. 2002) describes the habitat as dry, sandy or gravelly areas below 3000 feet elevation. The CNPS online Inventory (2007) says that it occurs in Mojavean desert scrub and Sonoran desert scrub at approximately 450 to 4,500 feet elevation.

#### *Distribution*

Utah vine milkweed is designated as a CNPS List 4 (watch list) plant, and CNDDDB data for List 4 species currently is available only in hardcopy format. Therefore, the CNDDDB information on this species was accessed as hardcopy files. Utah vine milkweed is known

<sup>1</sup> *Occurrence* is a location where a plant is found; an occurrence can consist of a single individual or a group of individuals, which may include sub-groups. Occurrences are, by definition, separated from the nearest occurrence(s) by one quarter mile or more (NatureServe, 2007; CNDDDB, 2007a). An occurrence may or may not be equivalent to a biological population.

from the Mojave Desert and elsewhere in southern California, where it has been recorded in San Bernardino, Riverside, San Diego, and Imperial counties (CalFlora, 2007; Jepson Online Interchange, 2007; CNDDDB, 2007c). It is also found in southern Nevada, northwestern Arizona, and southwestern Utah (Shreve and Wiggins, 1964).

According to the available records, the distribution of Utah vine milkweed in California appears to be concentrated in San Bernardino County, especially in the Twenty-nine Palms area, although it is known from a number of other locations. The Consortium of California Herbaria (Jepson Online Interchange, 2007) and the U.C. Riverside Herbarium list 11 specimens from the vicinity of 29 Palms (CalFlora, 2007; CNDDDB, 2007b), as well as several specimens from other locations in San Bernardino County, including the Ivanpah Mountains, Joshua Tree, and Old Woman Springs. In Riverside County it has been reported from two locations, near Blythe (CalFlora, 2007) and near Rancho Mirage, along the Pines to Palms Highway (CNDDDB, 2007c). In San Diego County, it is reported from the Sentenac Canyon, San Felipe, Blair Valley, Dolomite Mine, Earthquake Valley, and Coyote Mountain regions of the Colorado (Sonoran) Desert of Anza-Borrego Desert State Park (Beauchamp, 1986; Reiser, 1994; Jepson Online Interchange, 2007; CNDDDB, 2007c). The CNPS on-line Inventory (2007) reports it from Imperial County, where Reiser (1994) cites a location from near Coyote Wells, and there is a specimen from near Ocotillo Wells (CNDDDB, 2007c).

Three individuals of Utah vine milkweed were found, in three locations, all within proposed Ivanpah 1 (Figure 5.2-3). This is very likely an undercount because this species grows within shrubs and is difficult to find when not in flower, and because its growing season in 2007 appeared to encompass only a few weeks, meaning that during much of the timeframe in which protocol-level surveys were conducted, Utah vine milkweed was not growing and could not be detected. All individuals that were detected were found in small washes, growing up through other shrubs, including burrobrush and slender poreleaf (*Porophyllum gracile*). Two additional individuals of Utah vine milkweed were also located within the one-mile buffer but resources within the one-mile buffer were not mapped.

### ***Conservation Status***

Regarding the conservation status of Utah vine milkweed in California, the CNPS (2007) places it on List 4, a “watch” list, meaning that it is a plant of limited distribution. Its CNPS threat extension code is .3, meaning that it is not very endangered in California. The CNDDDB, using the natural heritage methodology ranking system (NatureServe, 2007), has assigned Utah vine milkweed a global rank of G4 and a state rank of S3.3 (CNDDDB, 2007a). A global rank of G4 means that throughout its global (worldwide) range, this species is apparently secure but factors exist that cause concern, such as threats or somewhat narrowly limited habitat. A state rank of 3 means that within California this species is known from 21 to 80 occurrences, or 3,000 to 10,000 individuals, or 10,000 to 50,000 acres, and the threat extension of .3 means that it is considered not very endangered in California. According to Reiser (1994), Utah vine milkweed populations in San Diego County are probably stable, based on historically low levels of impact to its habitat, but those on the western edge of the Colorado desert are uncommon and should be protected.

In Nevada, neither the Nevada Native Plant Society nor the Nevada Natural Heritage Program has included Utah vine milkweed on any of its conservation status lists (NNPS, 2007; NNHP, 2007). In Arizona, the Arizona Natural Heritage Program does not include Utah vine milkweed on its tracking list for at-risk plant species (ANHP, 2007). The

Arizona Native Plant Society is in the process of developing its list of rare plants (ANPS, 2007). The Utah Division of Wildlife Resource's Inventory of Sensitive Species and Ecosystems in Utah (1998) includes Utah vine milkweed on its "watch" list. It is known only from Washington County, in southwestern Utah (UDWR, 1998).

#### 5.2.8.3.3 Parish club-cholla (*Grusonia parishii*) CNPS 2.3

Parish club-cholla is a red- to yellow-flowered clonal stem succulent in the Cactus Family (Cactaceae). Its stem joints are 2-3 inches long, and obovoid, with separate tubercles. The major spines are distinctly flat with rough papillae on the largest spine. The fruits are usually not spiny, or only weakly so. The plants form spreading mats, with the ascending stems usually no more than about 8 inches in height. The blooming time is May to June or July.

*The Jepson Desert Manual* (Baldwin et al., 2002) describes the habitat of Parish club-cholla (as *Opuntia parishii*) as sandy flats from 2,950 to 3,935 feet elevation. The CNPS online Inventory (2007) reports that it occurs in Mojavean desert scrub, Sonoran desert scrub, and Joshua tree woodland, in sandy areas, at approximately 985 to 5,000 feet elevation. *A Flora of the Higher Ranges and the Kelso Dunes of the Eastern Mojave Desert in California* (Thorne et al., 1981) lists its habitat as sandy-gravelly flats, gravelly-rocky bajadas, and gentle limestone slopes.

Parish club-cholla has undergone several taxonomic revisions in recent years. Benson (1982) classified it as *Opuntia stanleyi* var. *parishii*. *The Jepson Desert Manual* (Baldwin et al., 2002) refers to it as *Opuntia parishii*. In the *Flora of North America*, Volume 4 (2007), Zimmerman and Parfitt use the name *Grusonia parishii*. This treatment will be followed in the second edition of *The Jepson Manual* (Parfitt, in preparation), and is used in the CNPS Inventory (2007) and the CNDDDB (2007a).

#### **Distribution**

In California, Parish club-cholla is known from the Mojave and Colorado deserts in San Bernardino, Riverside and Imperial counties (Jepson Online Interchange, 2007). It is also known from Nevada and Arizona, and possibly from Texas. The Consortium of California Herbaria (Jepson Online Interchange, 2007) lists 11 specimens of Parish club-cholla from California. Four of these are from eastern San Bernardino County, three of which are from the Mojave Desert, in the New York Mountains and the Clark Mountain Range. Five specimens are from north-central Riverside County, including three from the Colorado Desert, in the Little San Bernardino Mountains. One specimen is from Imperial County, from the western Salton Basin in the Colorado Desert, near Westmorland. Thorne et al. (1981) note Parish club-cholla (as *Opuntia stanleyi* var. *parishii*) as infrequent in the New York, Ivanpah and Clark mountains of eastern San Bernardino County.

Within the project area, in sites where project features are proposed, a total of 143 clones of Parish club-cholla were found in 96 mapped locations (see Figure 5.2-3). Within Ivanpah 1 (including the 250-foot buffer), 91 clones were mapped, mainly in the northern and eastern parts of the site. Within Ivanpah 3, 39 clones were mapped, all in the northwestern quadrant. In the area where the substation and co-located features are proposed, 13 clones of Parish club-cholla were mapped. These results are likely to be very accurate, based on the large size of most clones, which are distinctive in appearance, and were easy to visually locate, even at a distance, due to their presence in open, unobscured sites.

The microhabitat of Parish club-cholla within the project area consisted of sandy to somewhat gravelly flat uplands in Larrea-Ambrosia scrub.

### **Conservation Status**

The conservation status of Parish club-cholla in California has recently been evaluated and revised. In February 2007, the CNPS and the CNDDDB sent a recommendation to its regional review panel to add Parish club-cholla to the CNPS Inventory and the CNDDDB Special Plants, Lichens and Bryophytes List. This recommendation was adopted in March 2007. Parish club-cholla has been placed by the CNPS on List 2, meaning that it is considered rare, threatened or endangered in California, but more common elsewhere, and it has been given a threat extension code of .3, meaning that it is not endangered in California (CNPS, 2007). The CNDDDB, using the natural heritage methodology ranking system (NatureServe 2007), has assigned desert pincushion a global rank of G3G4 and a state rank of S2.3? (CNDDDB, 2007a). A global rank of G3G4 means that, considering its global (worldwide) range, this species is intermediate between ranks G3 and G4. A state rank of 2 means that within California this species is known from 6 to 20 occurrences, or 1,000 to 3,000 individuals, or 2,000 to 10,000 acres, and the threat extension of .3 means that it is probably not threatened in California, but more information on threat is needed.

In Nevada, neither the Nevada Native Plant Society nor the Nevada Natural Heritage Program has included Parish club-cholla on any of its conservation status lists (NNPS, 2007; NNHP, 2007). In Arizona, the Arizona Natural Heritage Program does not include Parish club-cholla on its tracking list for at-risk plant species (ANHP, 2007). The Arizona Native Plant Society is in the process of developing its list of rare plants (ANPS, 2007). The presence of Parish club-cholla in Texas is suspected but has not been confirmed (CNPS, 2007).

#### **5.2.8.3.4 Rosy two-toned beardtongue (*Penstemon bicolor* ssp. *roseus*) CNPS 2.3**

Rosy two-toned beardtongue is a tall, pink-flowered herbaceous perennial in the Figwort Family (Scrophulariaceae). It has gray-green, opposite leaves that are about 1 to 4 inches long, with sharply toothed margins (Baldwin et al., 2002). The leaves and stems of rosy two-toned beardtongue are very similar to those of Palmer's beardtongue (*Penstemon palmeri*), a common and widespread species. Flowers are required to separate these two taxa, both of which are known from the vicinity of the project area. The flowers of Palmer's beardtongue are longer (25 to 32 mm vs. 18 to 24 mm) than in rosy two-toned beardtongue; the throat of the corolla is wider (12 to 20 mm when pressed vs. 6 to 11 when pressed; the anther sacs are larger (1.8 to 2.2 mm vs. 1.3 to 2.0 mm), and the staminode is exserted in Palmer's beardtongue versus rarely exserted in rosy two-toned beardtongue (Baldwin et al., 2002). The flowering time for rosy two-toned beardtongue is May. For Palmer's beardtongue it is May to June.

Although The Jepson Flora Project (Jepson Online Interchange, 2007) follows the treatment of Dr. Noel Holmgren, and does not recognize subspecies for *Penstemon bicolor*, in this report populations of *Penstemon bicolor* found in California will be referred to as subspecies *roseus*. The CNDDDB, CNPS, and NNHP all use the name *Penstemon bicolor* ssp. *roseus* for the populations of this taxon found in California, which have pink flowers. *Penstemon bicolor* ssp. *bicolor* (yellow two-toned beardtongue) is a yellow-flowered form. According to Dr. James Morefield, NNHP Botanist, the NNHP recognizes the two color forms taxonomically for several reasons. They are known to mix in only two areas (Goodsprings and Blue Diamond Hills), probably with the aid of human dispersal. They appear to hybridize in only

one area (Goodsprings), but this might instead be a case of *ssp. bicolor* hybridizing with *Penstemon palmeri* to produce “*roseus*-like” forms and backcrosses. Otherwise, *ssp. bicolor* is much rarer than *ssp. roseus* in Nevada and is restricted to the northwestern portion of the species’ range, and on average occupies rockier sites at higher elevations (though with much overlap in both habitat and elevation). Also, a much greater percentage of *ssp. bicolor*’s range is impacted or threatened by urban expansion around Las Vegas. Therefore, even if it is a minor genetic variant, it is still at risk of being lost from the species as a whole. Its geographic and ecologic distribution strongly suggest there is something more significant than simple allelic variation that separates these two subspecies (Morefield, pers. comm.).

### ***Distribution***

Rosy two-toned beardtongue is found in the Mojave Desert of California, Nevada and Arizona. It has a very restricted distribution in California. The CNDDDB (2007b) has only three records for this taxon, all in eastern San Bernardino County. The habitat is described as rocky or gravelly sites, sometimes including disturbed areas, in Joshua Tree woodland and Mojave desert scrub, from about 2,100 to 4,500 feet in elevation (CNDDDB, 2007b; CNPS, 2007).

### ***Conservation Status***

Regarding conservation status, both California and Nevada recognize that rosy two-toned beardtongue is a rare plant. The CNPS Inventory (2007) includes it on List 2, meaning that it is rare, threatened or endangered in California, and more common elsewhere. Its threat code is .3, meaning that it is not very endangered in California. The Nevada Natural Heritage Program includes it on its Nevada At-Risk Plant and Animal Tracking List (NNHP, 2007), which includes species considered to be at-risk, rare, endangered, and threatened in Nevada. The Nevada Native Plant Society maintains a separate but similar list, which designates rosy two-toned beardtongue as a “watch” species (NNPS, 2007). According to Dr. Morefield, in Nevada, rosy two-toned beardtongue might be considered too common to be of concern, given its roadside and wash habitats. However, because of its narrow global range and similarity in appearance to the rarer subspecies *bicolor* (the yellow-flowered subspecies) when not in flower, and growing impacts in the Las Vegas area, it is being retained on the NNHP Tracking List.

No individuals of rosy two-toned beardtongue were positively identified within the project area. In several locations, 12 non-flowering plants were found in five locations with leaves and stems characteristic of both rosy two-toned beardtongue and Palmer’s beardtongue. Without flowers, these individuals could not be identified to species. The locations of these plants were mapped, and habitat information was recorded so that the sites could be revisited in the future (see Figure 5.2-3).

#### **5.2.8.4 Wetlands and Waters**

The entire study area is dissected by numerous ephemeral washes ranging in size from small (1 to 4 feet wide), weakly expressed erosional features to broad (over 10 feet wide), drainages. The active flow channels are devoid of vegetation and typically have a sandy-gravel substrate, although some washes also contained cobble and scattered larger rocks. Throughout the study area the majority of the washes are associated with Mojave Creosote Bush Scrub habitat. Species such as cheesebush, are common in some medium to large sized washes; especially in braided channels that contain slightly elevated areas intermixed with

the active flow channels. Mojave Wash Scrub is limited to the larger washes (typically over 15 feet) with sandy gravel substrate and well defined banks. Vegetation associated with these features included catclaw (*Acacia greggii*), cheesebush, Mojave Desert California Buckwheat (*Eriogonum fasciculatum* ssp. *polifolium*), desert willow (*Chilopsis linearis*), black-banded rabbitbrush (*Chrysothamnus paniculatus*), bladder-sage (*Salazaria mexicana*), desert almond (*Prunus fasciculata*), Virgin River encelia (*Encelia virginensis*), Anderson's boxthorn (*Lycium andersonii*), Cooper's boxthorn (*Lycium cooperi*), sand-wash groundsel (*Senecio flaccidus* var. *monoensis*), wire lettuce (*Stephanomeria pauciflora*), and blue sage (*Salvia dorrii*).

Based on the field data each wash was assigned a size category of 1, 2, or 3. Category 1 washes are relatively large ephemeral drainages over 10 feet wide. These features include single, large channels with well defined bed and banks, as well as broad, but weakly expressed, assemblages of braided erosional channels that collectively cover an area of at least 10 feet of active flow area. Category 2 includes ephemeral washes between 4 and 10 feet wide. As with category 1 washes, these features range from well defined single channels to shallow erosional braided channels. Category 3 includes weakly expressed erosional/flow channels that generally lack defined cut banks and are no more than 4 feet wide.

A total of 1,689 ephemeral washes were identified and mapped in the project study area, including 87 category 1 washes, 365 category 2 washes, and 1,237 category 3 washes (Table 5.2-11). Small to medium sized washes are common and widespread throughout the entire project area, while the larger washes are most abundant in the northern section of Ivanpah 3 as well as the eastern side of Ivanpah 2 (Figures 5.2-6 through 5.2-8).

#### 5.2.8.4.1 Reconnaissance Survey of the One-Mile Buffer

Reconnaissance-level surveys of the adjacent habitat within the one mile buffer were also conducted to determine if wetlands and waters occur. Numerous washes, similar in nature and number to those observed within the site, were observed within the one-mile buffer. The gradient of the slope decreases in an eastward direction within the one-mile buffer. Only a few defined channels were observed at the edge of the one-mile buffer that continue to Ivanpah Lake. Near Ivanpah Lake, the bed and banks of the ephemeral washes gradually become less defined and water appears to dissipate into broad sheet flow. Large storm water retention basins were observed east of the project study area on the north side of the golf course and along the western side of State Route 15.

#### 5.2.8.5 Special-Status Wildlife

Species-specific, protocol-level desert tortoise surveys were performed by qualified biologists between April 9 and June 5, 2007. Results of the protocol-level desert tortoise surveys are presented in the following section. Additionally, all wildlife and their sign incidental to these surveys conducted within, and adjacent to, the proposed project area were identified to species. Binoculars were used to aid in bird identification. Trees do not occur within the project area and no raptor nests were observed during the course of the field surveys. Additional informal wildlife surveys were conducted during all subsequent surveys by project biologists in the project area. Presence of several wildlife species and their sign were further documented via photographs taken within, and adjacent to, the proposed project area during the survey. The wildlife species observed during the desert tortoise surveys are listed in Table 5.2-5.



#### 5.2.8.5.1 Reptiles

##### *Desert Tortoise*

CNDDDB records occur for this species in the project area. Additionally, several desert tortoises and their sign were observed during the course of the field surveys. A total of 24 live tortoises, 74 carcasses, 182 burrows, 20 scat locations not associated with burrows, and 3 eggshell fragments were encountered during the course of the 1,214.6 transect (linear) miles covered during the field surveys. Using the aforementioned presence-or-absence protocol for these surveys, 100 percent coverage of the project area was achieved. Overall, more desert tortoise sign was encountered within the sites of Ivanpah 1-3, when compared to the Zone of Influence. This disparity results from the difference in survey coverage of the two areas. The 30 foot spacing of the transects surveyed within the sites of Ivanpah 1, 2, and 3 resulted in 100 percent coverage of these sites, while the greater distances between the Zone of Influence transects produced a representative sampling of all desert tortoise sign occurring within the Zone of Influence.

All resulting desert tortoise sign and their physical relation to the project area are illustrated in Figure 5.2-9. The figure displays all detected desert tortoise sign that has been identified by a color-coded number. These numbers are linked to the specific characteristics for each sign that are summarized in a spreadsheet (Appendix 5.2H). The spreadsheet contains tabs that sort the data by the number and locations of live tortoises, carcasses, burrows and other sign. Specific characteristics for all sign have been assigned with a number that may be found under the spreadsheet column entitled LOCID. These numbers are linked to the figure and provide specific characteristics of all sign documented on the project site. Additionally, totals of desert tortoise sign, separated by type and the Ivanpah SEGS survey areas in which they were found, are presented in Table 5.2-12. Wildlife and their sign were documented via photographs taken during the surveys. Of these, a desert tortoise, labeled "Photo 1," and a desert tortoise burrow with the characteristic half-moon shape, labeled "Photo 2," appear in Appendix 5.2I.

#### 5.2.8.5.2 Birds

##### *Western Burrowing Owl*

No CNDDDB records occur for this species in the vicinity of the project area. Although burrows were observed in the project area that would accommodate burrowing owls, no sign of burrowing owls (owls, carcasses, feathers, whitewash, or pellets) was observed during the desert tortoise protocol surveys of the project area. The surveys were performed during the breeding season for this species. Habitat conditions are suitable for this species to occur within the project area. Therefore, the probability for this species to occur at the project area is moderate. Additional surveys per CDFG protocol for the burrowing owl may be applicable and could be conducted concurrently with the desert tortoise clearance survey.

##### *Golden Eagle*

No CNDDDB records occur for this species in the project area; however, a golden eagle was observed flying nearby during the course of the field surveys. The habitat within, and adjacent to, the project area may provide suitable foraging habitat for this species. Therefore, presence of this species within, and adjacent to, the project site was established.

***Loggerhead Shrike***

No CNDDDB records occur for this species in the project area; however, loggerhead shrikes were observed during the course of the field surveys. The habitat within and adjacent to the project area may provide suitable foraging and nesting habitat for this species. Therefore, presence of this species within and adjacent to the project site was established.

***Le Conte's Thrasher***

No CNDDDB records occur for this species within the project area; however, Le Conte's thrasher was observed during the course of the field surveys. The habitat within, and adjacent to, the project area may provide suitable foraging habitat for the Le Conte's thrasher and provides suitable cover or nesting sites. Therefore, presence of this species within, and adjacent to, the project site was established.

***Crissal Thrasher***

No CNDDDB records occur for this species in the project area; however, Crissal thrasher was observed during the course of the field surveys. The habitat within and adjacent to the project area may provide suitable foraging and nesting habitat for this species. Therefore, presence of this species, within and adjacent to, the project site was established.

***Bendire's Thrasher***

No individuals or signs of Bendire's Thrashers were observed during the course of the field surveys; however, CNDDDB records occur for this species outside of the project area to the west and southwest. The habitat within and adjacent to the project area may potentially provide suitable foraging and nesting habitat for this species. Therefore, the probability of this species occurring within the project area is expected to be moderate.

***Gray-headed Junco***

No individuals or signs of gray-headed juncos were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area, in the Clark Mountains to the west. The habitat within, and adjacent to, the project area does not provide suitable foraging and nesting habitat for this species, though it may pass through during the course of migration. Therefore, the probability of this species occurring within the project area is expected to be low.

***Gray Vireo***

No individuals or signs of gray vireos were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area, in the Clark Mountains to the west. The habitat within, and adjacent to, the project area does not provide suitable foraging and nesting habitat for this species, though it may pass through during the course of migration. Therefore, the probability of this species occurring within the project area is expected to be low.

***Hepatic Tanager***

No individuals or signs of hepatic tanagers were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area, in the Clark Mountains to the west. The habitat within, and adjacent to, the project area does not provide suitable foraging and nesting habitat for this species, though it may pass through during the course of migration. Therefore, the probability of this species occurring within the project area is expected to be low.

*Vaux's Swift*

No CNDDDB records occur for this species in the project area; however, Vaux's swift was observed during the course of the field surveys. The habitat within, and adjacent to, the project area may provide suitable foraging habitat, although no nesting habitat for this species occurs within the project area. Therefore, presence of this species within, and adjacent to, the project site was established.

*Brewer's Sparrow*

No CNDDDB records occur for this species in the project area; however, Brewer's sparrow was observed during the course of the field surveys. The habitat within, and adjacent to, the project area may provide suitable foraging and nesting habitat for this species. Therefore, presence of this species within, and adjacent to, the project site was established.

*Summer Tanager*

No individuals or signs of summer tanagers were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area, in the Clark Mountains to the west. The habitat within, and adjacent to, the project area does not provide suitable foraging and nesting habitat for this species, though it may pass through during the course of migration. Therefore, the probability of this species occurring within the project area is expected to be low.

*Virginia's Warbler*

No individuals or signs of Virginia's warblers were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area, in the Clark Mountains to the west. The habitat within, and adjacent to, the project area does not provide suitable foraging and nesting habitat for this species, though it may pass through during the course of migration. Therefore, the probability of this species occurring within the project area is expected to be low.

**5.2.8.5.3 Mammals***American Badger*

No CNDDDB records occur for this species within the project area; however, a single American badger was observed within a den during the course of the field surveys. The habitat within, and adjacent to, the project area may provide suitable foraging and denning habitat for the American Badger. Therefore, presence of this species within, and adjacent to, the project site was established.

*Nelson's Bighorn Sheep*

According to the CNDDDB search, Nelson's bighorn sheep were last documented in the vicinity in 1986, outside of the project area. Approximately 150 sheep were documented approximately 2.9 miles west and northwest of the project area in the Clark Mountains. Escape cover and foraging habitat for this species to occur do not exist in the project area; therefore, it is anticipated that this species has a low probability of occurring within the project area, but may occur within the mountains to the west of the site.

*Townsend's Big-eared Bat*

No individuals or signs of Townsend's big-eared bats were observed during the course of the field surveys; however, a CNDDDB record occurs for this species outside of the project area to the south. The habitat within, and adjacent to, the project area may potentially

provide suitable foraging habitat for the Townsend's big-eared bat. Abandoned mines and caves to the north of the project area may provide potential roosting sites, although none exist within the project area. Therefore, the probability of this species occurring within the project area is expected to be low.

#### 5.2.8.5.4 General Wildlife

General biological surveys were conducted concurrently with the focused, species-specific, protocol-level desert tortoise surveys performed by qualified biologists from April 9 to June 5, 2007. All wildlife and their sign incidental to these surveys conducted within, and adjacent to, the proposed project area were identified as to species. Binoculars were used to aid in bird identification. No raptor nests were observed during the course of the field surveys. Additional informal wildlife surveys were conducted during all subsequent surveys by project biologists in the project area.

Presence of several wildlife species and their sign were further documented via photographs taken within, and adjacent to, the proposed project area during the survey. Of these, photographs of a long-nosed leopard lizard (*Gambelia wislizenii*), labeled "Photo 3," a desert kit fox (*Vulpes macrotis*), labeled "Photo 4," a black-tailed jackrabbit (*Lepus californicus*), labeled "Photo 5," and a pair of feral burros (*Equus asinus*), labeled "Photo 6," are presented in Appendix 5.2I. A complete list of wildlife species observed during the biological surveys is found in Table 5.2-5.

### 5.2.9 Environmental Analysis

This section identifies biological resources that may be affected either directly or indirectly by the project. Direct and indirect impacts may furthermore be either permanent or temporary in nature. These impact categories are defined below and are applied as part of the environmental analysis.

- **Direct:** CEQA define direct impacts as those impacts that result from the project and occur at the same time and place. Any alteration, disturbance, or destruction of biological resources that would result from project-related activities is considered a direct impact. Examples include loss of habitat resulting from clearing vegetation, encroaching into wetlands, diverting natural surface water flows, and the loss of individual species.
- **Indirect:** CEQA define indirect impacts as those caused by the project but that occur later in time or farther removed in distance, though still reasonably foreseeable and related to the project. As a result of project-related activities, biological resources may also be affected in a manner that is not direct. Examples include elevated noise and dust levels, increased human activity, decreased water quality, and the introduction of invasive wildlife (e.g., feral cats, dogs, and burros) and plants.
- **Permanent:** All impacts that result in the irreversible removal of biological resources are considered permanent. Examples include constructing a building or permanent road on an area containing biological resources.
- **Temporary:** Any impacts considered to have reversible effects on biological resources can be viewed as temporary. Examples include increased vehicle movement and noise

from construction activities and habitat loss during underground pipeline trenching activities (assuming re-vegetation).

Potential direct and indirect impacts to biological resources were evaluated to determine the permanent and temporary effects of project construction, operation, maintenance, and decommissioning of the project and supporting facilities.

#### 5.2.9.1 Standards of Significance

The project would result in a significant impact on the environment if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as endangered, threatened, candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFG or USFWS;
- Have a substantial adverse effect on federal or state protected waters of the U.S. (including wetlands) as defined by Sections 404 and 401 of the Clean Water Act or the Porter-Cologne Act, either through direct removal, filling, hydrological alteration, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory native wildlife corridors, or impede the use of wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan;
- Threaten to eliminate a plant or animal community;

CEQA Section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if not on one of the official lists if, for example, it is likely to become endangered in the foreseeable future.

#### 5.2.9.2 Potential Impacts of Project Construction, Operation, and Maintenance

##### 5.2.9.2.1 Construction of the SEGS Sites and Associated Buildings and Roads

The Ivanpah SEGS project is intended to be constructed in three phases, beginning with site preparation. Initial site clearing and grubbing of each phase would take place over a 5-month period, commencing in the third and fourth quarters of 2008, 2009, and 2010, respectively. The size of the area to be cleared and grubbed for Ivanpah 1 (Phase 1) is 852.7 acres. For Ivanpah 2 (Phase 2) the area is 849.2 acres, and for Ivanpah 3 (Phase 3) the area is 1,658.9 acres. However, within the heliostat array fields located in these sites, clearing and grubbing is to be performed only between every other row of the heliostat arrays that radiate outward in concentric arcs from their associated receiving towers. Inclusive of these

sites and the area used for access roads, transmission poles, the substation and administration buildings, the total area that will be permanently disturbed during by construction activities consists of approximately 3,400 acres, or about 5.25 square miles.

All of the areas to be used for construction laydown, staging, and parking are located within the solar fields of the project area. A construction equipment noxious weed wash station will be constructed within the project site or within an alternate area located outside of sensitive areas (e.g., special-status plant or wildlife population or suitable habitat, or a natural sensitive plant community) that is approved by BLM. No additional areas will be impacted by project construction activities.

### ***Natural Gas Pipeline Construction***

The proposed gas pipeline alignment is 5.3 miles long, with all but less than one-half mile of the gas line located within the project boundary, which will already be equipped with temporary exclusionary fencing. The primary method of construction includes excavation of an open trench approximately 36 inches wide and 4 to 10 feet deep, depending onsite-specific soil type. With loose soil, a trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. The pipeline will be buried to provide a minimum cover of 36 inches. During construction, a right-of-way 50 feet wide may be disturbed. This temporary construction corridor will be used to store the excavated soil, provide access for equipment and vehicles, and space for fitting the pipeline prior to installation and backfill via backhoe.

Construction would require temporary impacts on the corridor (e.g., vegetation clearing, trench excavation, compaction, dust generation, and restoration). These activities would be preceded by a biologist conducting pre-construction and clearance surveys for plant and wildlife species. The three site boundaries will be enclosed with chain-link fencing for security purposes and desert tortoise exclusionary fencing will be attached to the bottom of the chain link fencing. Temporary exclusionary fencing would be erected for the entirety of the utility corridor work area located outside of the project boundaries of the solar fields. Additionally, if sections of trench are to remain open overnight, temporary exclusionary fencing will be established for these areas as well. Short sections of trench will have ends that are sloped at a 3:1 ratio to allow for the egress of any wildlife. Longer sections of trench will be equipped with earthen plugs (bridges) approximately every 500 feet. However, especially for areas outside of the solar field boundaries, it is likely that only enough trench for the day will be cut to place pipe, fit, and backfill. This trenching limit prevents sections of trench from remaining open overnight and possibly entrapping wildlife. All open ends of pipes will be covered to prevent entrapment of wildlife. There are no significant wildlife habitats present that would be adversely affected by temporary use. The temporary construction disturbance area for the natural gas pipeline outside of the project boundary encompasses approximately 2.7 acres.

### ***Water Supply Pipeline Construction***

All water needs for the project will be supplied by two new onsite wells. Using a drill rig, the new wells will be located outside of the boundary fencing, to the east of Ivanpah 2. Temporary exclusion fencing will be used during the drilling and pipe-laying activities, and will extend around the entire work area. With regard to the pipeline for the water supply, the primary method of construction includes excavation of an open trench approximately 36 inches wide and 5 to 10 feet deep, depending onsite-specific soil type. With loose soil, a

trench up to 8 feet wide at the top and 3 feet wide at the bottom may be required. The pipeline will be buried to provide a minimum cover of 36 inches. During construction, a 50-foot wide right-of-way may be disturbed. This temporary construction corridor will be used to store the excavated soil, provide access for equipment and vehicles, and space for fitting the pipeline prior to installation and backfill via backhoe.

Construction would require temporary impacts on the corridor (e.g., vegetation clearing, trench excavation, compaction, dust generation, and restoration). These activities would be preceded by a biologist conducting pre-construction and clearance surveys. Temporary exclusionary fencing would be erected around the perimeter of the work area located outside of the project boundary. Additionally, if sections of trench are to remain open overnight, exclusionary fencing will be established for these areas. Short sections of trench will have ends that are sloped at a 3:1 ratio to allow for the egress of any wildlife. Longer sections of trench will be equipped with earthen plugs (bridges) approximately every 500 feet. However, especially for areas outside of the project boundary, it is likely that only enough trench for the day will be cut to place pipe, fit, and backfill. This trenching limit prevents sections of trench from remaining open overnight. All open ends of pipes will be covered to prevent entrapment of wildlife. Likewise, any open holes left by the drill rig or stem left in the hole will be covered by plywood or similar material. There are no sensitive wildlife habitats present that would be significantly affected by this action. The temporary construction disturbance area for the water supply line outside of the project boundary encompasses approximately 2 acres.

### *Operation and Maintenance*

The heliostat field and solar power generation equipment will be started daily and generated electricity will be interconnected to the SCE grid to increase capacity to the existing El Dorado-Baker-Cool Water-Dunn Siding-Mountain Pass 115-kV line heading southwest. Raw water will be drawn daily from one of two onsite wells, located east of Ivanpah 2, to supply the boiler.

Groundwater will go through a treatment system for use as boiler make-up water and to wash the heliostats, and water consumption will be minimal (estimated at a total of 80 to 100 acre-feet/year for all three phases). No reject streams from water treatment are planned to be generated onsite under the treatment scheme. However, for current planning purposes, two drying beds of about 40 feet by 60 feet are included. They can serve for boiler commissioning and emergency outfalls from any of the processes. If these pits are used, they will be appropriately covered to prevent any standing water from subsidizing potential predators of desert tortoise or other special-status species.

Each phase includes a small onsite wastewater plant located in the power block that treats wastewater from domestic waste streams such as showers and toilets. A larger sewage package treatment plant will be located at the Administration Building/Operations and Maintenance area, located between Ivanpah 1 and 2. Sewage sludge will be removed from the site by a sanitary service provider. All wastewater will be recycled in the system, except for a small stream that will be treated and used for landscape irrigation. If necessary, a small filter/purification system will be used to provide potable water at the Administration Building.

Operation and maintenance requirements necessitate the washing of the solar heliostats on a nightly basis (all heliostats are washed once every 2 weeks). Best Management Practices (BMPs) for the use of wash water are outlined in the Storm water Pollution Prevention Plan (SWPPP). The water used for this process will be of relatively high quality but will contain trace amounts of chemicals such as oxygen scavengers that are not expected to result in substantial changes in water quality. A pressure washer or other method will be used to wash the heliostats to minimize the amount of water used, and no water is anticipated to run offsite as a result of these washing activities. Due to the high evaporation rates in the area, and the minimal amount of water used, it is likely that wash water will evaporate at or just below the ground surface. By implementing good engineering practices and BMPs in the project design and operation, and because storm water discharge during construction will adhere to a SWPPP and to state water quality standards, no significant impacts to surface or subsurface water quality are expected during construction or operation of the project.

Rapidly germinating weeds such as tamarisk, identified east of I-15 in the one-mile buffer, rapidly germinate and grow in areas of moist soil such as those expected to occur in the solar fields after wash water is used to clean the mirrors. Aggressive weed control will be needed during construction, operations, and maintenance activities to minimize the germination, introduction, and spread of noxious weeds.

In regard to storm water runoff and hydrologic connectivity, the solar field development will maintain unobstructed sheet flow. The finish grade of the power block and power tower areas will be 3 feet above the surrounding grade with moderate transition slopes to protect them from floods and return the relatively small local diversions to sheet flow through the solar fields. Access roads will be protected from floods via ditches and local fords with reinforced concrete shoulders. Overall the project is being designed to maintain, to the extent possible, the existing sheet flow patterns and the resulting ephemeral drainages on the site.

Impacts to biological resources resulting from the construction of project facilities (e.g., solar fields, substations, and power towers), access roads, and staging areas, and the subsequent operation and maintenance of these facilities depend primarily on the proximity and quality of the habitat, the presence and rarity of special-status species, the presence and quality of breeding habitat, and the effectiveness of measures instituted to protect these resources from exposure to project activities. As discussed in detail below, impacts to biological resources due to construction of the solar fields, project facilities, and installation of other project elements such as the gas pipeline, as well as operation and maintenance, are considered less than significant with the incorporation of the mitigation measures provided in Section 5.2.8, Mitigation Measures.

#### 5.2.9.2.2 Impacts to Special-Status Plants

##### *Perennial Plants*

Construction of the proposed project site would result in permanent impacts to three special-status plant species (as shown in Table 5.2-6). These impacts total:

- 122 individuals of desert pincushion in 114 locations
- 3 individuals of Utah vine milkweed mapped in 3 areas
- 143 Parish club-cholla plants in 96 separate locations



These localities would either be displaced by project elements or impacted during construction or operation of the project.

In addition, 12 individuals (mapped in 5 separate locations) of a species of beardtongue (*Penstemon* sp.) that could not be identified, but might be rosy two-toned beardtongue, a special-status plant, also would be permanently impacted by construction and operation. The identity of this species will be confirmed prior to construction.

It is assumed that these plants would be directly impacted either during construction or through operation and maintenance of the facility over the long term. Except for the Utah vine milkweed, which is a CNPS List 4 plant, these special-status plants meet the definition of a rare plant pursuant to CEQA. Impacts to these special-status plants are significant and mitigation is required. With the incorporation of mitigation measures as described in Section 5.2.8 that includes stockpiling soil, protection of offsite populations, translocation, salvage, and payment of fees in-lieu of mitigation, impacts to rare plants are expected to be less-than-significant.

### ***Annual Plants***

As described in the survey limitations section, the rare plant surveys in support of this project were conducted during an extremely dry year, and only a very few live annual plants were present in the project area due to low rainfall. Therefore, the 2007 surveys targeted only shrubs and herbaceous perennials. It is possible that special-status annual plants could also occur within the project site. None of the annual plants identified to date as potentially occurring are federally- or state-listed (Table 5.2-6).

If annual plants are determined to occur during preconstruction surveys, this loss potentially could be significant depending on the magnitude of the impact and the conservation status of the species. Mitigation for the potential loss of annual plants, should they be determined to occur, is also described in Section 5.2-8, Mitigation Measures.

### **5.2.9.2.3 Noxious Weeds**

Noxious weeds are likely to invade disturbed areas and may continue to invade for many years following the initial ground disturbing activity and washing of the mirrors. The removal of existing vegetation and soil disturbance due to construction could create conditions suitable for the germination, establishment, and spread of noxious weeds. Construction equipment is a known noxious weed vector and can transport weeds from other areas into previously weed-free areas, or cause the rapid and widespread increase of already established noxious weeds (Von Der Lippe and Kowarik, 2007).

Four noxious weeds were observed within the project area during the 2007 surveys. Three of these are already widespread in the project area and their control is not practicable: red brome, Mediterranean grass, and London rocket. However, because 2007 was a very dry year, it is possible that other weeds also occur that were not detectable.

Rapidly germinating weeds such as tamarisk, identified east of I-15 in the one-mile buffer, rapidly germinate and grow in areas of moist soil such as those expected to occur in the solar fields after wash water is used to clean the mirrors. Tamarisk in particular is of concern because plants can resprout from cut or burned stems and root fragments. Seedlings can germinate within 24 hours (from spring into early fall), and can grow up to 9 feet in the first year. Tamarisk can grow from a seedling to a mature flowering plant in one summer season.

Mature trees can produce several hundred thousand seeds per year. Seeds are spread either by wind or by water (Cal-IPC, 2007; Zouhar, 2003). Other noxious weeds, such as Sahara mustard, and others shown in Table 5.2-4, are also of concern. The possible spread or introduction of noxious weeds due to project construction is a potentially significant impact. Aggressive weed control throughout the project site and along roadsides used to access the site will be required throughout project construction and operation. Weed control measures may also exclude the reintroduction of select native desert species, depending on the time of year weed control is implemented and what specific weed control techniques are used.

#### **5.2.9.2.4 Impacts to Creosote Bush – White Bursage – Barrel Cactus Vegetation**

Approximately 3,400 acres (5.25 square miles) of the Creosote Bush – White Bursage – Barrel Cactus Community Type could be displaced by project facilities, disturbed by construction, or permanently lost by ongoing, long-term, disturbance associated with operations and maintenance of facilities and the need to reduce standing vegetation due to fire hazard.

Data on this plant community is limited, though it is estimated that approximately 10,000 acres total of this plant community exists in less than 20 to 30 locations and that it is restricted to limestone substrate (Pers. Comm., Keeler-Wolf, 2007). This acreage estimate represents the most current data on this plant community. However, this plant community is not well studied or mapped, and it is possible that it is more common than currently documented. This habitat type was also observed within the one-mile buffer during reconnaissance-level surveys, but the amount present was not quantified.

#### **5.2.9.2.5 Impacts to Wetlands and Other Waters**

Construction activities, including vegetation clearing and grading, would result in alteration, rerouting, fill, and loss of some of the existing ephemeral washes in the project footprint. Features most likely to be affected are the small, weakly expressed ephemeral washes that lack defined bed and bank characteristics. Following construction, annual rainwater will free-flow across the entire site with the exception of the power block areas, the substation, and the facilities and storage building. Water diversion berms between 3 to 6.5 feet high would be constructed along the western side of the power block structures with funnel depressions along each end that will channel flows impinging on the berm into drainage ditches that will discharge back into the solar field downstream of the power block corners. As needed during operations, accumulated sediment and debris along the perimeter fence will be removed to ensure fence integrity and to maintain natural drainage across the site.

Construction of the power blocks, substation and administration building would result in the permanent loss of approximately 15,979 linear feet of ephemeral washes (Table 5.2-13). This represents a permanent direct impact to approximately 1 percent of the total washes identified in the project study area, including approximately 0.6 percent of the larger category 1 washes. Additional construction activities such as the re-routing of Colosseum Road, installation of the water and natural gas lines, and placement of additional power poles, will result in temporary disturbance and a small amount of additional impacts to the washes in the project study area.

Operation and maintenance of the heliostat mirrors would require vehicle access between every other row to wash the mirrors on a regular basis. Less frequent access would be necessary for maintenance and vegetation clearing. These activities would involve driving

through existing drainages and also through drainages that have reformed to natural processes.

Construction and operation of the facility are not likely to result in a substantive loss of ephemeral washes or a change in the drainage patterns or hydrology of the site because of the large number of washes that are expected to naturally reform. The temporary and permanent loss of ephemeral drainages is therefore not considered to be a significant biological resource impact. Construction and operation may require permits from the USACE, RWQCB, and CDFG, and these permits may have special conditions; however, replacement of lost ephemeral wash habitat is typically not required. BMPs, as listed in the project SWPPPs, will be implemented during project construction and operation.

#### 5.2.9.2.6 Impacts to Special-Status Wildlife Species

##### *Overview*

Temporary and permanent impacts to special-status wildlife could occur from removal and crushing of shrubs and herbaceous vegetation (resulting in loss of nesting/breeding and foraging habitat), vegetation clearing, trenching, entombment of animals in dens or burrows, collisions with vehicles, collision with power line conductors or towers, electrocutions, increased predation on sensitive species, disturbance from noise, and further fragmentation of habitat. These impacts have the potential to be significant.

However, with the implementation of awareness training; pre-construction and clearance surveys; avoidance, mitigation and compensation measures proposed by the Applicant and required by the CEC Biological Resources Mitigation Implementation Monitoring Plan (BRMIMP) and the BLM, USFWS, and CDFG, there will be no significant, unmitigated environmental impacts associated with the construction and operation of the Ivanpah SEGS. Species-specific impacts are discussed in the following sections.

##### *Desert Tortoise*

Several agencies including USFWS, BLM, and CDFG are concerned about the potential project-related impacts to desert tortoises and their habitats. The desert tortoise is listed as a federally and State threatened species. Therefore, it is protected under the FESA, the CESA, and Title 14, California Code of Regulations (Sections 670.2 and 670.5), and any potential impacts to individuals of this species, or habitat critical to their survival, resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. Significant direct and indirect impacts could occur to the federally and State listed desert tortoise as a result of the Ivanpah SEGS if the recommended mitigation measures detailed in Section 5.2.6 are not implemented.

The proposed project site does not lie within critical habitat for the desert tortoise; however, the Ivanpah critical habitat unit is located west, south, and southeast of the site and tortoises were observed onsite during surveys. The construction of the Ivanpah SEGS would permanently impact approximately 3,400 acres of desert tortoise habitat within the project area through the clearing and grubbing of vegetation for the installation of project facilities and structures. Without the implementation of appropriate mitigation measures, these actions could result in direct mortality, injury, or harassment of individuals as a result of encounters with vehicle or heavy equipment, whether on the project site or from these vehicles straying from existing roads or designated areas into adjacent habitat. Other direct impacts could include individuals being crushed or entombed in their burrows, possible

collection or vandalism by project-related personnel, disruption of tortoise behavior during construction or operation of facilities, disturbance by noise, injury, or mortality from encounters with workers' or visitors' pets. Also, tortoises may take shelter under parked vehicles and be killed, injured, or harassed when the vehicle is moved.

Additionally, the permanent loss of desert tortoise habitat that would occur from the removal and crushing of shrubs and herbaceous vegetation would indirectly impact the species through the loss of burrowing, breeding, and foraging habitat. Other potential direct impacts to desert tortoise resulting from construction and installation, operation, modifications or improvements, and maintenance of project facilities may include project facilities potentially acting as a barrier impeding the natural movements of desert tortoise throughout their habitat and compaction of soils. Also, increased levels of surface-disturbing activities and potentially wash water-induced vegetation may increase the abundance of alien plants and wildfire frequency (Brooks et al., 2003).

Increased vehicle travel will occur from the construction and improvement of access roads, which could potentially disturb or even kill individual tortoises. During the month-long time period in which the Ivanpah SEGS workforce is at its largest, an estimate of the average daily traffic would include 39 transport buses and 192 personal vehicles. Likewise during this time period, the average total of construction truck traffic would be approximately 145 per day. However, for all other periods during construction (and to a much greater extent during operations and maintenance activities) daily average vehicle activity would be far less. In addition to potential collisions between vehicles and individual tortoises, additional potential impacts may include habitat fragmentation, increases in predator (especially common raven and coyote) populations using vehicle road kills to supplement the diet, changes in plant community from fires, loss of foraging and burrowing habitat from the road, restriction of movements and gene flow of tortoises, changes in plant composition due to alien plant introductions along road corridors, and mortality of tortoises from various illegal activities such as collecting for pets or food (Berry et al., in press) and shooting of tortoises (Berry, 1986). The potential for the most severe impacts are along paved roads where vehicle frequency and speed is greatest though tortoises on dirt roads may also be affected depending on vehicle frequency and speed. Census data indicate that desert tortoise numbers decline as vehicle use increases (Bury et al., 1977) and that tortoise sign increases with increased distance from roads (Nicholson, 1978). Additional unauthorized impacts that may occur from casual use of the access roads in the project area include unauthorized trail creation.

Human activities in the Ivanpah SEGS project area potentially provide food in the form of trash and litter, or water, which attract tortoise predators such as the common raven, kit fox, and coyote (Berry, 1985; BLM, 1990). Natural predation in undisturbed, healthy ecosystems is generally not an issue of concern. However, predation rates may be altered when natural habitats are disturbed or modified. Common raven populations in some areas of the Mojave Desert have increased 1,500 percent from 1968 to 1988 in response to expanding human use of the desert (Boarman, 2002). Since ravens were scarce in this area prior to 1940, the current level of raven predation on juvenile desert tortoises is considered to be an unnatural occurrence (BLM, 1990). In addition to ravens, feral dogs have emerged as significant predators of the tortoise. Dogs may range several miles into the desert and have been found digging up and killing desert tortoises (USFWS, 1994a; Evans, 2001). Dogs brought to the

project site with visitors may harass, injure, or kill desert tortoises, particularly if allowed off leash to roam freely in occupied desert tortoise habitat. The worker environmental awareness training and restriction on pets being brought to the site required of all personnel will reduce the potential for these impacts.

If tortoise-proof fencing is installed, over time breaches may occur, thus allowing tortoises to pass through the barrier and be impacted by project-related activities. Temporary fencing left in place following removal of the threat to tortoises in the area may also contribute to habitat fragmentation. Materials and equipment left behind following construction activities may entrap or entangle tortoises, attract desert tortoise predators such as common ravens and coyotes, or provide shelter for tortoises, which when removed may result in displacement or injury of the tortoise.

Construction of the gas pipeline corridor and electrical transmission line interconnections would result in a total temporary impact to an additional 15.5 acres of desert tortoise habitat. The impacts of habitat restoration after the 50-year life of the facility and weed-control during operations and maintenance in these and other project areas may be significant without proper planning and implementation. These activities may involve the use of heavy equipment, all-terrain vehicles (ATVs), or hand-tools and include re-contouring, ripping of soil, ground watering, broadcast seeding, use of water trucks for dust abatement, and planting of live vegetation. Use of vehicles and heavy equipment may increase the risk of injury or mortality of individual tortoises, result in short-term displacement and/or noise during the project, create short-term loss of vegetation, and result in temporary ground disturbance due to fencing or the installation of barricades. Many potential effects of habitat restoration are the same as, or similar to, other surface-disturbing activities identified above. Activities associated with weed treatments that may affect the desert tortoise include application of herbicides, clearing or cutting vegetation by hand or with machinery, and use of ATVs on disturbed areas for site access. Effects to the desert tortoise include unintentional removal or destruction of plants used by tortoises for forage or shelter, soil compaction, alteration of local microclimate through vegetation removal, and harassment, injury, or mortality of tortoises as a result of vehicle or machinery operation.

Beneficial effects of the habitat restoration activities may include long-term improvement of species diversity (including food sources), long-term reduction in erosion, long-term increased habitat quality, increased tortoise abundance and distribution through habitat enhancement, decreased potential for future alien plant invasions, and decreased wildfire potential.

Potential impacts from the activities of capturing, handling, and relocating desert tortoises might be significant. Blythe et al. (2003) found that Sonoran desert tortoises moved out of an area of potential impact a distance of less than 0.5 mile had returned to their home ranges within a few days. Unless movement barriers are in place, tortoises that move a distance of less than 0.5 mile out of a potential impact area are likely to return to potentially harmful conditions. Tortoises may die or become injured by capture and relocation if these methods are performed improperly, particularly during extreme temperatures, or if they void their bladders. Averill-Murray (2001) determined that tortoises that voided their bladders during handling had significantly lower overall survival rates (0.81 to 0.88) than those that did not void (0.96). If multiple desert tortoises are handled by biologists without the use of

appropriate protective measures, such as reused latex gloves, pathogens may be spread among the tortoises.

The desert tortoise was listed by the federal and State agencies in response to habitat loss and degradation caused by numerous human activities including urbanization, agricultural development, military training, recreational use, mining, and livestock grazing. The loss of individual desert tortoises to increased predation by common ravens, collection by humans for pets or consumption, collisions with vehicles on paved and unpaved roads, and mortality resulting from diseases also contributed to the listing of this species by the USFWS. Several of these impacts have the potential for occurring in the Ivanpah SEGS project area. In accordance with Section 7 of the Endangered Species Act of 1973, as amended (Act) (16 USC 1531, et seq.), a formal consultation with the USFWS would be required.

The aforementioned potential impacts may have a significant impact upon the desert tortoise. However, with the implementation of various measures including exclusionary fencing, worker environmental awareness training, pre-construction and clearance surveys, avoidance, mitigation, and habitat compensation, as well as those required by the CEC, CDFG, BLM, and USFWS, these impacts would be successfully mitigated and considered less-than-significant. Mitigation measures to reduce potentially significant impacts to the tortoise to less-than-significant levels are detailed in Section 5.2.8.

#### **5.2.9.2.7 Burrowing Owl**

Although no CNDDDB records occur in the vicinity of the project area, and no burrowing owls were observed during the course of the biological field surveys, suitable habitat is present for the burrowing owl within the project site, and therefore further surveys would be necessary to determine absence of the species within and adjacent to the project site. The burrowing owl is a FSC and a CSC. Additionally, it is protected under the MBTA and several CDFG codes including 3503, 3503.5, and 3513, and therefore any potential impacts to individuals of this species resulting from the proposed project must be mitigated for, if the presence of burrowing owl is established per CDFG protocol. Noise and activity associated with construction of the Ivanpah SEGS during the non-nesting season could disturb burrowing owls and cause them to temporarily avoid the construction area. This will be a less-than-significant impact, as construction activities are temporary in nature. Impacts to burrowing owls resulting from the project could occur if burrowing owls move into the construction zone during the nesting season (February 1 through August 31), prior to the start of construction, or during construction. There is the potential for individual owls, their young, and their eggs to be destroyed or their nests abandoned. It is anticipated that the project will result in the permanent loss of foraging habitat for burrowing owls. However, this loss may be considered a less-than-significant level of impact because of the vast amount of similar habitat that would remain available to owls after construction. Mitigation measures to reduce potentially significant impacts to burrowing owls to less-than-significant levels are detailed in Section 5.2.8.

#### **5.2.9.2.8 Raptors**

Although trees do not exist within or adjacent to the project site, hills, specifically on the eastern and western edge of Ivanpah 3, and existing power poles do occur nearby that may provide suitable nesting and roosting structure for raptors. Raptors are protected under various federal and state codes, including the MBTA, and CDFG codes 3503, 3503.5, and

3513. Golden eagles are afforded additional protection under the BGEPA and CDFG code 3511. Therefore, any potential impacts to individuals or nests of these species resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. Noise and activity associated with project construction during the non-nesting season could disturb raptors and cause them to temporarily avoid the construction area. This would be a less-than-significant impact, given that no raptors were observed nesting in the survey area and the temporary nature of the impact. Sensitive raptor species could abandon nesting attempts if disturbed during the breeding season during construction. This could be a potentially significant impact, absent of mitigation. It is anticipated that the project will result in the permanent loss of potential foraging habitat for raptors. However, this loss is expected to be a less-than-significant impact because of the vast amount of similar habitat throughout the project area and in the surrounding vicinity. Mitigation measures to reduce potentially significant impacts to raptors to less than significant levels are included in Section 5.2.6.

#### 5.2.9.2.9 Nesting Migratory and Resident Birds

Almost all birds are protected under the MBTA and CDFG code 3503. Additionally, bird species designated as CSC are also protected under Title 14, California Code of Regulations (sections 670.2 and 670.5). Although nesting birds were not observed during the surveys, any potential impacts to individuals or nests of these species resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. Potential impacts from construction and demolition activities on resident nesting birds could primarily occur from temporary construction noise and clearing and grubbing of the site. It is anticipated that the project will result in the permanent loss of potential foraging and nesting habitat for some migratory and resident birds. However, this loss is expected to be a less-than-significant impact because of the vast amount of similar habitat in the surrounding vicinity. All ground disturbing activities will be pre-surveyed and initial grubbing of the three sites should be conducted in the winter (before March) prior to the start of nesting season. The impacts of the aforementioned actions and the potential for loss of bird species due to collisions with vehicles and equipment would be significant in the absence of mitigation. However, mitigation measures designed to minimize these potential impacts to less-than-significant levels are detailed in Section 5.2.6.8

#### 5.2.9.2.10 American Badger

American badger was observed during the course of the biological field surveys conducted from April 9 to June 5, 2007. The project area contains both foraging and denning habitat for this species. The American badger is a CSC, and is therefore afforded protection under Title 14, California Code of Regulations (Sections 670.2 and 670.5). Therefore, any potential impacts to individuals of this species resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. Construction of Ivanpah SEGS could potentially result in significant impacts to the American badger, via mortality, injury, or harassment, as well as the loss of approximately 3,400 acres of habitat, absent of the recommended mitigation measures. Concurrent with the desert tortoise clearance survey, a qualified biologist will perform a preconstruction survey for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. With the implementation of the mitigation measures detailed in Section 5.2.8, potential impacts to the American badger will be less than significant.

#### 5.2.9.2.11 Townsend's Big-eared Bat

Crevices within the nearby hills, specifically those on the eastern and western edge of Ivanpah 3, may provide suitable roosting habitat for bats. Townsend's big-eared bat is a CSC, and is therefore afforded protection under Title 14, California Code of Regulations (Sections 670.2 and 670.5). Therefore, any potential impacts to individuals or maternity roosts of this species resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. The noise generated from construction activities has the potential to significantly affect a bat maternity roost. If such a roost is located in the vicinity of the project area, specific mitigation measures presented in Section 5.2.6 are intended to minimize this impact to a less than a significant level. Although the clearing of vegetation could potentially impact foraging habitat for this species, the majority of foraging would likely be concentrated over riparian areas, which are not found within the project area. Therefore, the insect prey base of this species will be minimally impacted, and this bat species is not expected to be significantly impacted.

#### 5.2.9.2.12 Nelson's Bighorn Sheep

Based on the CNDDDB search, approximately 150 Nelson's bighorn sheep were last documented 2.9 miles west and northwest of the project area in the Clark Mountains in 1986. Nelson's bighorn sheep is a CSC, and is therefore afforded protection under Title 14, California Code of Regulations (Sections 670.2 and 670.5). Therefore, any potential impacts to individuals of this species resulting from the proposed project must be mitigated for to reduce those impacts to less-than-significant levels. Because escape cover and foraging habitat for this species does not exist in the project area, it is anticipated that this project will not impact this species. Therefore, no specific mitigation measures for Nelson's bighorn sheep are considered necessary.

#### 5.2.9.2.13 Noise and Lights

Noise from construction, operations, and demolition activities could temporarily discourage wildlife from foraging and nesting immediately adjacent to the project area. Many bird species rely on vocalization during the breeding season to attract a mate within their territory. Noise levels from certain construction, operations, and demolition activities could reduce the reproductive success of nesting birds. Construction activity noise levels are provided in Section 5.7. The expected loudest composite noise levels are approximately 89 dBA at 50 feet from the activity, which results in noise levels of approximately 77 and 61 dBA at distances of 200 and 400 feet from the activity, respectively.

Noise impacts to wildlife are difficult to measure; however, results of several studies summarized by Golden, et al. (1980; *Environmental Impact Data Book*, Table 8-9, page 517) indicate no impacts from aircraft noise at 75 dBA for several wildlife species (caribou, waterfowl, moose, bison). Burrowing owl, for example, have been noted to reside within 100 to 200 feet of an active railway with measured noise levels of approximately 90 dBA at a distance of 50 feet from the railway (see Rio Linda/Elverta Power Project, 01 AFC-01, Appendix J-1, Map Sheet A).

The construction period is relatively short, about 20 months per phase, and wildlife usually becomes habituated to ongoing general construction noise. Weisenberger et al. (1996) found that bighorn sheep responded to aircraft over-flights with increased heart rates and altered behavior; however, animal response decreased with increased exposure. In general, nearly all equipment will be specified to have near-field maximum noise levels that do not exceed



90 dBA at 3 feet from the activity (or 85 dBA at 3 feet where available as a vendor standard) to limit the noise exposure of plant personnel to acceptable levels (Section 5.7). As a result of these design features, the temporary nature of these activities, and the adherence to noise reducing mitigation measures, the noise levels at the project fence line are not expected to have any significant impact on nearby wildlife resources.

Operational noise, anticipated to be less than 30 dBA, will be more consistent and at a much lower level than for construction. The power plant will operate an average of about 10 hours a day, 7 days a week throughout the year, with the exception of a scheduled shutdown in late December for maintenance. The solar field and power generation equipment will be started up each morning after sunrise and insolation build-up, and shut down in the evening when insolation drops below the level required to generate power. In addition, the solar nature of the facility limits its primary operations and noise generating activities to the daylight hours when ambient levels (such as from I-15, which is located 0.8 mile from Ivanpah 1) are typically highest. Therefore, with the implementation of noise-reducing mitigation measures, the impact on surrounding wildlife is expected to be less-than-significant.

Bright night lighting could disturb wildlife that occurs adjacent to the project site (e.g., nesting birds, foraging mammals, and flying insects). Night lighting is also suspected to attract migratory birds to areas and, if the lights are on tall towers or structures, collisions could occur. Additionally, certain lighting may attract insects which in turn may attract birds such as nighthawks and bats to forage. The Ivanpah SEGS lighting will meet the requirements for security, operations and maintenance, and safety, and will be shielded and pointed downward and away from the habitat outside of the project area to minimize impacts to nesting birds and other nearby wildlife, and to reduce the potential for avian and bat attraction and collision. Also, night lighting will have switches to allow them to be turned off when not in use. FAA-required lights will be the only permanently-on lighting for the taller facility structures.

#### 5.2.9.2.14 Impacts to Trees

Trees do not exist within the project area; therefore, impacts are not expected.

#### 5.2.9.2.15 Potential for Collision and Electrocutation Hazard to Birds and Bats

The project design for all phases will result in the construction of 8 power towers 312 feet in height, 5 power towers 459 feet in height, and 3 boiler stacks 131 feet in height. Numerous other project-related structures lower in height will also be constructed. These structures, along with the proposed electric transmission lines, could potentially result in bird and/or bat collisions. Most bird collisions involve nocturnal migrants flying at night in inclement weather and low-visibility conditions, colliding with tall, guyed television or radio transmission towers (CEC, 1995; Kerlinger, 2000 in *Final Staff Assessment for Contra Costa Power Plant*).

Birds that fly into the reflected sunlight between the heliostats and the power towers could be impacted. The heat intensity of the reflection is high enough to potentially in flame the bird. However, many birds generally migrate at night and at an altitude that would avoid ground structures, except when crossing over topographic features (e.g., ridge tops) or when inclement weather forces them down closer to the ground. Therefore, low-flying

individual passerines may be impacted during daylight operation. However, the facility will be shut down at night and during inclement weather.

The project area is not known to be a flyway for migrating birds. There are no topographic or ecological features that would attract birds to this location or “funnel” them into the vicinity of the power towers, boiler stacks, or other elevated features of the project. Bird collisions are expected to be rare due to the lack of proximity to migratory pathways, ridge tops, and concentrations of waterfowl. Based on the lack of locations of concentrated roosting sites for bats specific to the project area, it is anticipated that large numbers of bats would not use specific routes to move between roosts and foraging and watering sites. Shielded lighting consisting of sodium bulbs that are directed downward will reduce the potential for avian and bat attraction and collision. Therefore, the potential for bird and/or bat collisions with the boiler stacks, poles, electric conductor wires, structures, and power towers of the project is considered less-than-significant, provided the measures in Section 5.2.8 are implemented.

Large raptors can be electrocuted by transmission lines when a bird’s wings simultaneously contact two conductors of different phases, or a conductor and a ground. This happens most frequently when a bird attempts to perch on a structure with insufficient clearance between these elements. The presence of distribution lines 69 kV or less represents more of a danger to raptors than transmission lines greater than 69 kV, because the spacing between elements in distribution lines is much less than that of transmission lines. This increases the chance of phase-to-phase or phase-to-ground contact because the conductors are closer together than the wingspan of many raptor species, thus allowing the bird species to contact both elements at once causing electrocution (APLIC, 1996). The proposed transmission lines would be 115 kV. While increasing the potential for electrocution associated with the installation of distribution and transmission lines in the project area is a potential significant direct impact to raptors, the line will incorporate design measures to greatly reduce the chance of electrocution. The installation of transmission lines and poles will be constructed according to the most recent “raptor-friendly” guidelines (APLIC, 2005), ensuring that conductor wires are appropriately spaced to minimize the potential of raptor electrocution. Additionally, all overhead power lines will be equipped with raptor perch guards. Therefore, additional transmission line segments would not increase avian electrocutions in the area, and the “raptor-friendly” design would reduce potential impacts to less-than-significant. These mitigation measures are outlined in Section 5.2.8.

#### **5.2.9.2.16 Impacts to Wildlife Corridors**

A wildlife corridor can be defined as a linear landscape feature of sufficient width and buffer to allow animal movement between two patches of comparatively undisturbed habitat or between a patch of habitat and vital resources. Because the project site is located in an area of abundant, contiguous open space, it is not considered a wildlife corridor. Desert washes may function as wildlife corridors; however, the significance of these in the project area is substantially reduced because of the presence and vehicle traffic associated with the nearby I-15 highway in limiting wildlife movement. Additionally, during the preliminary design phase, project boundaries and security fencing were shifted approximately 130 to 340 feet away from the adjacent hills to allow a wildlife corridor between the security fencing and the hillsides at the request of CEC. Thus, the project area is

not considered to be a wildlife corridor and wildlife corridors will not be discussed further in this section.

#### **5.2.9.2.17 Impacts to Biological Resources of Recreational or Commercial Value**

The nearest recreational land use within close proximity to the project study area is the Primm Valley Golf Club, Desert Course, which is located approximately 0.5 mile east of the Ivanpah 1 site boundary. The golf course is affiliated with the Primm Valley Casino Resorts located in Las Vegas, Nevada. This is a public course, with special rates for guests of Primm Valley Casino Resorts.

The Ivanpah Dry Lake is located approximately 1.6 miles east of the project site and covers approximately 35 square miles. This area is open to non-motorized vehicles and is a popular destination for activities such as kite buggying, land sailing, long-distance archery, and kite demonstrations.

The NEMO Plan area is also a popular area that provides diverse recreational and scenic opportunities for off-highway vehicle (OHV) use.

Although recreational activities occur in the general vicinity, there are no known recreational activities that occur on a regular basis within the project area. Hence, there are no biological resources of recreational or commercial value (such as hunting, fishing, or bird watching) that would be affected by the project.

#### **5.2.9.3 Conflict with Regional Habitat Conservation Plans**

The proposed project does not conflict with the CDCA or NEMO. The Ivanpah SEGS site is located in the southeastern portion of the NEMO Planning Area Boundary. The site is located within areas in the CDCA that are designated Multiple-Use Class L (Limited Use) and Multiple-Use Class M (Moderate Use) according to the California Desert Conservation Area Map 1 Land-Use Plan 1999 (BLM, 1999). Because the project site lies outside of USFWS designated critical habitat and a DWMA, these activities are not expected to conflict with the USFWS Desert Tortoise Recovery Plan. Therefore, construction of the project would not conflict with the goals of the BLM conservation plans or other regional conservation plans.

#### **5.2.10 Cumulative Effects**

Although the environmental effects of an individual project may not be significant when that project is considered in isolation, the combined effects of several projects may be significant when considered collectively. This section addresses potential cumulative effects to the environment that could be associated with implementation of the Ivanpah SEGS in concert with one or more other past, present, and reasonably foreseeable probable future projects.

Section 15130 of the CEQA Guidelines requires that a project's cumulative effects be discussed when "[t]he incremental effect is cumulatively considerable . . ." According to CEQA Guidelines §15065(c), the term cumulatively considerable means "[t]hat the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects . . ."

Specifically, CEQA Guidelines §15355 defines cumulative effects as:

“[t]wo or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present and reasonably foreseeable probable future projects.

Cumulative effects can result from individually minor but collectively significant projects taking place over a period of time.”

Consideration of the Cumulative effects that would be associated with the Ivanpah SEGS is focused on activities located within the Ivanpah Valley. Those activities include past, present, and reasonably foreseeable future developments within the valley.

#### 5.2.10.1 Current Setting

The Ivanpah Valley has been previously impacted by a variety of activities ranging from the construction and continued use of major highways and secondary roads, unimproved roads and trails, pipelines, the Union Pacific Railroad, casinos and retail businesses, recreational opportunities (such as the Primm golf course and land sailing/racing on the Ivanpah Dry Lakebed), transmission lines and substations, and other facilities developed around the Nevada communities of Jean and Primm. Development within the area has resulted in the loss of natural resources and the transition of the valley from its original undisturbed natural setting to one that, in many locations, represents an industrial or commercial setting. Much of the Ivanpah Valley is crossed by high voltage transmission lines. There are five reasonably foreseeable future projects in the vicinity of the proposed project. They are:

- Desert Xpress Rail Line
- Improvements to I-15
- Las Vegas Valley Water District Pipeline
- Southern Nevada Supplemental Airport (Ivanpah Valley Airport)
- Table Mountain Wind Generating Facility

Descriptions of these projects are provided in Section 5.6.7, Land Use. In addition, there are seven other future projects that are located in the vicinity of the proposed project. These other seven projects are not considered reasonably foreseeable because they have not moved forward in the development process to the point where sufficient information is publicly available to determine if their impacts, when combined with the proposed project's impacts, would result in significant adverse cumulative impacts. Therefore, this cumulative effects discussion will focus on the five reasonably foreseeable future projects and their impacts when combined with those of the proposed project.

#### 5.2.10.2 Cumulative Effects to Biological Resources

Development within the Ivanpah Valley has resulted in the loss of special-status plant and wildlife species and general wildlife habitat due to construction, increased human presence, and recreational activities. Grazing, off-road recreational activities, and construction of

transmission lines, facilities, and roads east of I-15 have contributed to the cumulative degradation of biological resources in the area. Project area lands west of I-15 have been less affected; however, the area has been previously impacted by construction of transmission lines, the KRG T pipeline and compressor station, mining, and other activities. Planned future actions, such as those that may occur as a result of the development of the Ivanpah Valley Airport, completion of the numerous rail lines, and others will possibly continue this trend.

The Ivanpah SEGS site and associated linear features are located entirely on federal land under BLM's jurisdiction, and are therefore subject to the provisions of BLM's CDCA Plan (Revised, 1999). Additionally, the Ivanpah SEGS project area, as well as much of the Ivanpah Valley, lies within the southeastern portion of the NEMO Planning Area Boundary. The NEMO Coordinated Management Plan (July 2002) addresses threatened and endangered species conservation and recovery within this area through the proposed establishment of large, well-distributed desert wildlife management areas. However, while construction of the Ivanpah SEGS would contribute to the loss of vegetation and wildlife resources within the Ivanpah Valley, this land is located outside of critical habitat, and within an area that is designated Class L Limited Use and Class M Moderate Use according to the CDCA Map 1, Land-Use Plan, 1999 (BLM, 1999). Allowable uses for these land use designations include electrical generation facilities, and specifically solar electrical generation facilities. Other permitted land uses on BLM-managed land include, transmission facilities, distribution facilities, communication sites, grazing, mineral exploration and development, motorized vehicle access/transportation, and recreation. The land use designations for the Ivanpah SEGS site remain the same under the NEMO Coordinated Management Plan.

Therefore, the actions of the Ivanpah SEGS project are consistent with both the CDCA Plan and the NEMO Coordinated Management Plan. Likewise, because the Ivanpah SEGS site is located outside of USFWS designated critical habitat and the DWMA's, this project does not conflict with the Desert Tortoise Recovery Plan, a recovery plan which describes a strategy for the recovery and delisting of the desert tortoise. Nevertheless, implementation of the outlined mitigation measures for the Ivanpah SEGS project will reduce any potential impacts to insignificant levels, in order to comply with all LORS detailed in Section 5.2.2. Loss of individual species of plants and animals is expected to be less than significant from the development of this project because special-status species considerations were integrated into all parts of the planning process, and avoidance and minimization measures have been identified to help reduce the risk and potential losses.

Because of the scope of both the NEMO and CDCA Management Plans, as well as the designation of the DWMA's (as outlined in the USFWS Desert Tortoise Recovery Plan), each of the projects mentioned in this section are required to mitigate for any potential impacts that may result from their project actions to levels that are less-than-significant, both individually and in consideration of all other projects in the Ivanpah Valley area. As a result, the Cumulative effects are less-than-significant.

### 5.2.11 Mitigation Measures

The following section describes the proposed measures that are intended to avoid, minimize, and mitigate for potential adverse effects of the project to biological resources,

and monitor and document the effectiveness of the measures. A BRMIMP will be prepared prior to construction that outlines how the Applicant would implement the mitigation measures in order to maintain any action authorized, funded, or carried out by state or federal lead agencies that is not likely to jeopardize the continued existence of listed species. The BRMIMP outline is presented in Appendix 5.2J. Additionally, a site-specific WEAP (Worker Environmental Awareness Program) will be administered by the biologist as part of the mitigation plan, and it is intended to educate construction workers and operators on the sensitive resources in the area and the measures that will be undertaken to avoid or minimize impacts to these resources. Elements of the WEAP include:

- An oral, video/powerpoint, and/or written materials presentation. The presentation will include the types of construction activities that may impact biological resources and the measures developed to avoid such impacts. The WEAP will also include appropriate contact procedures and personnel information. The program will include information regarding encounters with wildlife and dealing with situations involving biological resources.
- Special emphasis will be placed on explaining the protection measures developed for the desert tortoise and the consequences of noncompliance. At a minimum, the desert tortoise training will contain information on distribution, behavior and ecology, sensitivity to human activities, legal protection, penalties for violations, reporting requirements, and protection measures. In addition, the program will include fire prevention measures to be implemented by workers during project activities. Participants will sign an attendance sheet documenting their participation in the training.

Measures to educate construction workers and facility operators on measures that will be required to minimize the introduction and spread of noxious weeds will also be included.

General construction measures to be implemented within the project area will be developed as part of the WEAP and will include the following:

1. Provide construction monitoring by a qualified biologist to ensure compliance with the protection measures.
2. Demarcate access routes and construction areas to minimize impacts to habitat and special-status species during construction and operations.
3. Conduct pre-construction and clearance surveys for special-status species within impact areas.
4. Prepare standardized construction monitoring and compliance reports that analyze the effectiveness of the measures.
5. Removal of all project components, including solar power production elements and associated facilities and buildings following closure of the project site.
6. Rehabilitation to pre-construction conditions as determined appropriate during coordination with the BLM, USFWS, and CDFG, including topography, hydrology, and revegetation, as determined appropriate, for corridors outside of the site boundaries

(e.g. gas line) following construction, and for the entirety of the project site following project closure.

### 5.2.11.1 Mitigation Measure 1 – Site Rehabilitation Plan

#### 5.2.11.1.1 Temporary Impacts

With the exception of temporarily disturbed areas (e.g., the gas line), the expected SEGS facility lifetime is 50 or more years. Temporarily disturbed areas such as the gas line corridor will be rehabilitated and revegetated after construction as described in the site rehabilitation plan to be included in the Biological Resources Mitigation Implementation Monitoring Plan (BRMIMP). Elements of the rehabilitation plan are described below.

The Site Rehabilitation Plan will include the following sections and details: (1) goals and objectives of the rehabilitation; (2) a description of methods employed to achieve the rehabilitation goals and objectives; (3) success criteria used to determine if the rehabilitation is successful; (4) a monitoring and maintenance program, including details on remedial measures; (5) noxious weed control plan; (6) a description of annual reporting; and (7) a rehabilitation implementation and monitoring timeline and schedule of planned activities. The scope of this plan will be proportionate to the magnitude of the expected impact. The corridor to be disturbed by the gas line construction is not expected to exceed 50 feet in width. All practicable measures to avoid sensitive resources (e.g., mapped special-status plant species) will be taken during construction to reduce impacts to the maximum degree possible.

Arid region soils typically do not have substantial soil horizon development, and soils in the project area are sandy and rocky, with little organic matter. However, soil mycorrhizal fungi, seeds, or rhizomes may be present to aid in rehabilitation. Therefore, the top six inches of topsoil in the trenched area will be salvaged and either stockpiled within the corridor until it can be respread following construction. Decompacting and/or scarifying (e.g., imprinting) the respread topsoil area prior to seeding may be required. The disturbed corridor will then be seeded with native species such as creosote bush and white bursage, or other species native to the area. Target vegetation density and composition will be comparable with the surrounding landscape. Seeding will be timed to coincide with seasonal rains (typically late fall and early spring) but desert rainfall patterns are unpredictable. If rainfall is low, germination will be poor, and re-seeding may be required.

#### 5.2.11.1.2 Permanent Impacts

Over the long-term, once the SEGS facilities are no longer needed, the structures will be removed and the project area will be rehabilitated to approximate preconstruction conditions. Because rehabilitation of the site is not to occur for more than 50 years a draft conceptual plan will be included as part of the BRMIMP. This draft plan can then be updated at a later date (but no later than 1 year prior to closure) that would reflect the current technology and regulatory requirements at the time of facility closure.

Desert systems are ecologically fragile, and it will not be practicable to recreate the lost habitat elements exactly after 50 years of site disturbance. Goals of the site rehabilitation after facility closure will be to recreate natural creosote-bush dominated habitat. The purchase and preservation or creation of suitable replacement habitat will be required due to the long-term time lapse (more than 50 years) that is equivalent to a permanent loss of this habitat. The purchase and preservation plan for the permanent loss of habitat will be

closely coordinated with the BLM, USFWS, and CDFG as part of the desert tortoise mitigation process.

A formal rehabilitation plan for the SEGS facility closure will be developed by project owner and submitted to the BLM, USFWS, CDFG, and the CEC's Compliance Project Manager (CPM) at least one year prior to facility closure. Sensitive natural community type habitat mitigation elements will be addressed as a component of the desert tortoise habitat mitigation effort.

The SEGS facility closure rehabilitation plan will follow currently accepted site rehabilitation practices in use by BLM, USFWS, and CDFG or other appropriate resource agencies, at the time of project closure, and it is expected to include the following sections and details: (1) goals and objectives of the rehabilitation; (2) a description of methods employed to achieve the rehabilitation goals and objectives; (3) success criteria used to determine if the rehabilitation is successful; (4) a monitoring and maintenance program, including details on remedial measures; (5) noxious weed control plan; (6) a description of annual reporting; and (7) a rehabilitation implementation and monitoring timeline and schedule of planned activities.

#### 5.2.11.2 Mitigation Measure 2 – Noxious Weeds

Noxious weed control will be implemented during construction and operation of the SEGS project to reduce the potential impact of noxious weed spread or introduction.

A Noxious Weed Control Plan will be prepared and submitted to BLM for review and approval prior to construction. The Noxious Weed Control Plan will contain: (1) an assessment of noxious weeds known to occur or that potentially could occur in the project area; (2) a target list and photographs of noxious weeds that will be controlled; (3) a description of measures to be used to survey for their presence during construction and operation; (4) monitoring and weed control methods to be employed during operation; and (5) reporting requirements.

Because it is not practicable to eradicate the three relatively widespread noxious weeds already occurring in the project area, these species will not be targeted for control. The noxious weeds of highest concern (those ranked "A" – eradication and possible quarantine, and "B" – eradication at the discretion of the CDFA), or weeds that are of concern to the BLM, will be included in the target list of weeds to be controlled.

A worker environmental awareness program (WEAP) will be implemented to train contractors and site operators in the sight identification of noxious weeds and control measures to be employed.

The noxious weed control plan will outline steps to take to identify and treat weeds prior to seed maturation and dispersal to minimize the potential for weed establishment. In order to identify weeds while infestations are relatively small and easily controlled, the biological monitor will conduct regular checks for noxious weeds and full inspections at least 2 times per year (timed to occur early and late in the growing season) with special emphasis placed along the primary construction access roads.

Noxious weed infestations will be flagged by the biological monitor and controlled, using either mechanical (hand pulling, mowing) or chemical methods as approved by the BLM. Only state and BLM approved herbicides will be used, and all herbicide applicators will



possess a valid qualified herbicide applicator license from the state. All herbicide applications will follow U.S. Environmental Protection Agency label instructions and be performed in accordance with federal, state, and local laws and regulations.

Vehicles and construction equipment will be kept weed-free. A cement (or other BLM-approved material) construction equipment wash station will be constructed in a location outside of sensitive resources that is approved by the BLM. The wash station will be surrounded by a perimeter barrier such as weed-free hay bales, to prevent the transport of noxious weed seed from the wash station into adjacent areas. All construction equipment and vehicles entering or leaving the site must be washed to remove soil and vegetation from the undercarriage and tires of the construction equipment prior to transport on/offsite.

All temporarily disturbed areas (e.g., gas line), will be rehabilitated following construction as outlined in the Site Rehabilitation Plan (Mitigation Measure 1).

### 5.2.11.3 Special-Status Species

Special-status plant and wildlife species are known to occur within the project area. Specific mitigation and protection measures were developed to address these special-status species with emphasis placed on the most sensitive resource, the desert tortoise. The following mitigation and protection measures will be implemented during preconstruction, construction, operation, and demolition activities.

#### 5.2.11.3.1 Special-Status Plants

Measures outlined in the BRMIMP and WEAP will be implemented during and following construction to avoid and minimize impacts to special-status plants. Mitigation Measure 2, Noxious Weeds, will be implemented to reduce the potential spread or introduction of noxious weeds into suitable offsite special-status plant habitat. Additional mitigation measures for special-status plants are described below.

#### *Mitigation Measure 3 – Preconstruction Surveys for Plants*

Prior to construction, preconstruction habitat suitability surveys will be conducted to identify specific areas in which surveys for annual species should occur. Additionally, protocol surveys for annuals and perennial special-status plants will be conducted in any project areas that were not included in the 2007 surveys, and the unknown *Penstemon* species in Ivanpah 3 will be identified to determine if it is a special-status plant. The preconstruction surveys will be conducted during the correct season and will be conducted by botanists familiar with the flora of the region. If special-status plants are identified, efforts will be made to avoid and minimize the potential impact to the maximum degree possible. If avoidance is not practicable, mitigation will be required. Mitigation for Impacts to Special-Status plants is described below in Mitigation Measure 4.

#### *Mitigation Measure 4 – Special-Status Plants*

Avoidance of some of these special-status plant populations may be feasible during construction of the proposed project, but over the long-term, avoidance is not practicable due to the need to reduce the standing vegetation due to fire hazards and to maintain clear access to wash the heliostat mirror array and otherwise operate the facility.

Mitigation for the loss of special-status plants will be developed in coordination with the resource agencies, as part of the habitat replacement plan for the loss of desert tortoise, and

may consist of the following approaches (or a combination thereof): (1) permanent protection of an existing offsite native population; (2) translocation of existing plants to an offsite location; (3) salvage of the plants to the botanical institutions and native plant nurseries; (4) salvage of the plants to the general public; (5) mitigation banking; and (6) a fee in lieu of mitigation.

Brief summaries of these mitigation approaches are listed below.

- Permanent protection of existing offsite population (within 2 years after project implementation). The size of the area required would be dependent upon the number of species impacted, the rarity status of the special-status plant impacted, the quality of the preserved habitat, and size of the protected plant population.
- Translocation (defined as transplanting plants to an offsite location) of salvaged perennial species to an offsite location that will be protected. If this option is selected, a rare plant translocation plan will be prepared as part of the BRMIMP and submitted to the CEC, CDFG, and BLM for approval prior to implementation.
- Perennial cactus could also be donated to a native plant restoration nursery, or to a botanical garden for study and propagation, or offered as salvage to the local cactus societies and interested public. A plan detailing the appropriate salvage techniques to be employed and desert tortoise monitoring during plant salvage will be required. This plan will be included in the BRMIMP and submitted to the CEC, CDFG, and BLM for approval prior to implementation.
- Seed from annual plants could also be collected and donated to botanical gardens or to universities for propagation and study.
- If special-status annual plants are identified during preconstruction surveys, seed will be collected and respread to a suitable offsite location and monitored to determine if the seed germinates and grows. If this option is selected, a rare plant seeding and monitoring plan will be developed. This plan will be included in the BRMIMP and submitted to the CEC, CDFG, and BLM for approval prior to implementation.
- A fee in lieu of, or as partial mitigation, may also be implemented. The exact fee and the appropriate fee recipient would be determined through coordination with the CEC, BLM, CDFG, and USFWS.

#### 5.2.11.3.2 Special-Status Wildlife

##### *Mitigation Measure 5 – Desert Tortoise*

1. An Authorized Biologist (aka Designated Biologist) (AB) and Biological Monitor(s) (BM) will be appointed to oversee compliance with the protection measures for the desert tortoise and other species. The AB or BM will be onsite during all ground disturbing project activities. The AB or BM will have the right to halt all activities that are in violation of the measures. Work will proceed only after hazards to the desert tortoise are removed, the species is no longer at risk, or the individual has been moved from harm's way by the AB. The AB and BM will have a copy of all the compliance measures when work is being conducted onsite.

2. The project owner will submit the names and statement of qualifications of all proposed ABs and BMs to USFWS, BLM, CDFG, and CEC for review and approval at least 30 days prior to initiation of any tortoise handling, clearance and preactivity surveys. Project activities will not begin until the ABs and BMs are approved by the aforementioned agencies. Only ABs will be allowed to handle and relocate desert tortoises when necessary. Biological monitors will ensure compliance with the protection measures, but will not be allowed to survey for or handle desert tortoises. Workers will notify the AB or BM of all desert tortoise observations.
3. The AB and BM will be responsible for awareness training, surveys, compliance monitoring and reporting. A desert tortoise clearance survey per USFWS protocol (USFWS, 1992) will be performed at the three sites, utility corridors, roads, and any other areas that will be impacted by construction activities. The three site boundaries will be enclosed with chain-link fencing for security purposes and desert tortoise exclusionary fencing will be attached to the bottom of the chain link fencing. The utility corridors will be temporarily fenced on each side of the corridor. The bottom 20 to 24 inches of the exclusionary fencing will be constructed of 1 to 2 inch galvanized vertical mesh fence material. The fence will be buried between 6 to 12 inches below ground or bent at a right angle towards the outside of the fence and covered with dirt, rocks or gravel to prevent the tortoise from digging under the fence. Gates will provide minimal ground clearance to deter ingress by tortoises. Once the sites and corridors are fully enclosed with fencing, the ABs will relocate tortoises outside the fenced areas to sites designated by the BLM and USFWS. Once the areas are deemed free of desert tortoises after two consecutive surveys, then heavy equipment will be allowed to enter the sites to perform earth work such as clearing, grubbing, leveling, and trenching. Following installation, the fencing will be inspected quarterly and after major rainfall events. Any damage to the fencing will be repaired immediately. Any preactivity surveys for other construction areas will be performed within 72 hours of work activities.
4. Unavoidable burrows inhabited by tortoises will be excavated by ABs using hand tools, with excavations permitted prior to 12:00 noon. To prevent reentry by a tortoise, all burrows that do not contain tortoises will be collapsed. Tortoises excavated from burrows will be relocated to unoccupied natural or artificial burrows immediately following excavation. The new burrow will be located at least 300 feet from the outside of the fenced project areas and will be of similar size, shape and orientation to the original burrow. Relocated tortoises will not be placed in existing occupied burrows. The ABs will wear disposable surgical gloves when handling tortoises. A new pair will be donned for each tortoise handled to avoid the transmission of upper respiratory tract disease (URTD). Equipment will be sterilized between each use. Tortoise handling, burrow construction, egg handling, and other procedures will follow those described in the Guidelines for Handling Desert Tortoise During Construction Projects (Desert Tortoise Council, 1994).
5. Existing routes of travel to and from the project site will be used. Cross country vehicle and equipment use outside designated work areas will be prohibited. Personnel will exercise caution when traveling to and from the site. To minimize the likelihood for vehicle strikes of desert tortoises, the speed limit when traveling on Colosseum Road

and other dirt access routes within desert tortoise habitat will not exceed 20 miles per hour.

6. A trash abatement program will be established. Trash and food items will be contained in closed containers and removed periodically to reduce the attractiveness to opportunistic predators such as common ravens, coyotes, and feral dogs.
7. Workers will be prohibited from bringing pets and firearms to the project site.
8. Any time a vehicle or construction equipment is parked for longer than 2 minutes in desert tortoise habitat, the ground under the vehicle will be inspected for the presence of desert tortoise before it is moved. If a desert tortoise is observed, it will be left to move on its own. If it does not move within 15 minutes, the AB will remove and relocate the animal to a safe location.
9. Activities will be restricted to a pre-determined corridor. If unforeseen circumstances require project expansion, the potential expanded work areas will be approved by BLM and surveyed for desert tortoises prior to use of the area. All appropriate protection measures will be implemented within the expanded work areas based on the judgment of the BLM and AB.
10. Trenches, bores and other excavations that constitute wildlife pitfalls will be immediately backfilled, sloped at a 3:1 ratio at the ends, covered, or fully enclosed with fencing to prevent any entrapment by the end of each work day. All excavations in tortoise habitat will be inspected periodically throughout and at the end of each workday by the AB or BM. Should a tortoise become entrapped, the AB will remove and relocate the tortoise to a safe location.
11. Within desert tortoise habitat, any construction pipe, culvert, or similar structure with a diameter greater than 3 inches stored less than 8 inches aboveground on the construction site for one or more nights will be inspected for tortoises before the material is moved, buried, or capped. As an alternative, all such structures may be capped before being stored on the construction site or placed on pipe racks. These materials will not need to be inspected or capped if they are stored within the fenced project areas after the clearance surveys have been completed.
12. All vehicles and equipment will be in proper working condition to ensure that there is no potential for fugitive emissions of motor oil, antifreeze, hydraulic fluid, grease, or other hazardous materials. The AB, BM, CEC, and BLM will be informed of any hazardous spills within 24 hours. Hazardous spills will be immediately cleaned up and the contaminated soil will be properly disposed of at a licensed facility.
13. Intentional killing or collection of either plant or wildlife species including listed species such as the desert tortoise at the project site and surrounding areas will be prohibited. The AB, BM and BLM will be notified of any such occurrences within 24 hours.
14. For emergency response situations, the AB will notify the BLM within 24 hours. As a part of this response, the BLM may require additional measures to protect the desert tortoise. During any responses related to human health, fire, hazardous waste, or repairs requiring off-road vehicle and equipment use, the BLM may also require measures to recover damaged habitat.

15. Water will be applied to the construction right of way, dirt roads, trenches, spoil piles and other areas where ground disturbance has taken place to minimize dust emissions and topsoil erosion. During the desert tortoise active season, a BM will patrol these areas to ensure water does not puddle for long periods of time and attract desert tortoises, common ravens, and other wildlife to the site.
16. To compensate for desert tortoise habitat affected during construction, project owner will offset these effects through either a BLM or USFWS acceptable land acquisition or an assessed financial contribution based on the final construction footprint. The compensation ratio is expected to be 1:1 for all non-critical desert tortoise habitat.
17. Upon locating a dead or injured desert tortoise, the AB will make initial notification to the BLM and USFWS within 24 hours of its finding. The notification must be made by telephone and writing to the BLM Needles Field Office, the USFWS Ventura Field Office and the CPM. The report will include the date and time of the finding or incident (if known), location of the carcass, a photograph, cause of death (if known), and other pertinent information. Tortoises fatally injured or killed from project-related activities will be submitted for necropsy as outlined in Salvaging Injured, Recently Dead, Ill, and Dying Wild, Free-Roaming Desert Tortoises (*Gopherus agassizii*) (Berry, 2001), at the expense of project owner. Tortoises with minor injuries will be transported to a nearby qualified veterinarian for treatment at the expense of project owner. If an injured animal recovers, the BLM, USFWS, CDFG and the CPM will be contacted for final disposition of the animal.
18. On an annual basis until construction is completed, the AB will prepare a report for the BLM, USFWS, CDFG, and the CPM documenting the effectiveness and practicality of the protection measure and making recommendations for modifying the measures to enhance species protection. The report will also provide information on the biological support including the awareness training, clearance/preactivity surveys, monitoring activities and any observed desert tortoises including injuries and fatalities.
19. The project owner will submit a list of planned maintenance activities by name, category, location, and approximate start date to the BLM, USFWS, CDFG, and the CPM. The agencies will have 30 days following receipt of the report to consider the proposed actions. In the event of a rejection, the project owner will work with the agencies to resolve the issues. Agency approvals of the proposed list of projects are valid for one year after agency acceptance.
20. A program will be implemented to mark of all desert tortoises that will be relocated from the project area. The markings will utilize a numbering scheme, applied through non-invasive means, similar to that in use by other agencies (e.g., BLM, USFWS). Notching will not be used. For a period of 1 year following the relocation, the desert tortoises will be monitored in terms of survivorship by the AB. All pertinent information will be recorded, such as behavior, physical characteristics, health characteristics and any visible signs of URTD, as well as any potential anomalies the individual desert tortoise might display.

***Mitigation Measure 6 – Burrowing Owl***

The following measures are proposed for the Burrowing Owl. These measures are outlined in the CDFG Memorandum entitled Staff Report on Burrowing Owl Mitigation (CDFG, 1995). The objective of the measures is to avoid and minimize impacts to burrowing owls at the project site and preserve habitat that will support viable populations.

1. Ground-disturbing actions should be carried out from September 1 to January 31, which is prior to the nesting season. Since the timing of nesting activity may vary with latitude and climatic conditions, this timeframe should be adjusted accordingly.
2. A preconstruction survey of suitable habitat at the project site and a 150-meter (approximately 500-foot) buffer (where possible and appropriate based on habitat) will be surveyed within 30 days prior to construction to ensure no additional burrowing owls have established territories since the Spring 2007 desert tortoise presence/absence survey where the burrowing owl survey was performed concurrently. If ground-disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site will be resurveyed.
3. Occupied burrows will not be disturbed during the nesting season (February 1 through August 31) unless the AB verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
4. To offset the loss of foraging and burrow habitat on the project site, foraging habitat (calculated on a 100-meter [approximately 300 feet] foraging radius around the burrow) per pair or unpaired resident bird, will be acquired and permanently protected. Any protected lands will be part of the desert tortoise mitigation plan and would be located adjacent to occupied burrowing owl habitat and at a location acceptable to CDFG and the CPM. Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.
5. When destruction of occupied burrows is unavoidable, existing unsuitable burrows will be enhanced (cleared of debris), or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands.
6. If owls must be moved away from the disturbance area, passive relocation techniques (as described below) will be used rather than trapping. At least one or more weeks will be necessary to allow the owls to acclimate to the alternate burrows.
  - a. **Passive relocation with one-way doors.** Owls will be excluded from burrows in the immediate impact zone and within a 50-meter (approximately 160-foot) buffer zone by installing one-way doors in burrow entrances. One-way doors (e.g., modified dryer vents) will be left in place 48 hours to ensure owls have left the burrow before excavation. Two natural or artificial burrows will be provided for each burrow in the project area that will be rendered biologically unsuitable. The area will be monitored daily for one week to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

- b. **Passive relocation without one-way doors.** Two natural or artificial burrows will be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area will be monitored daily until the owls have relocated to the new burrows. The formerly occupied burrows will then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

***Mitigation Measure 7 – Nesting Migratory and Resident Birds***

1. The ABs and BMs will perform a preconstruction survey, concurrent with the desert tortoise clearance survey, for nesting birds in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If construction is to occur during the nesting season between February 1 and August 31, all sites to be disturbed will be surveyed for ground-nesting and shrub-nesting birds prior to construction. If an active nest of a species protected under the MBTA or BGEPA is found, construction activity will be limited within 250 feet of the nest, which will be monitored by the BM to ensure the nest is not impacted. Construction activities and timing may be modified to avoid impacts to nesting birds.
2. Facilities that may attract avian species such as common ravens to perch or nest will be fitted with anti-perching devices such as Bird-Be-Gone or similar material.
3. Frequent disturbance (every few days) may be initiated in the project areas just prior to the nesting season to discourage nesting in the construction right-of-way.
4. During both the construction and O&M phases, a speed limit of 20 mph will be established and enforced. The speed limit will reduce the potential for loss of bird species due to collisions with vehicles.

***Mitigation Measure 8 – Raptors and Bats***

1. Although trees do not exist within, or adjacent to, the project site, hills, specifically on the eastern and western edge of Ivanpah 3, and existing power poles do occur nearby that may provide suitable nesting and roosting structure for raptors. If construction activities take place between February 1 and August 31, the AB or BM will survey for raptor nests within these areas prior to the start of construction. Additionally, crevices within these hills may provide suitable roosting habitat for bats. The raptor and bat surveys will occur at construction sites adjacent to suitable nesting and roosting habitat for raptors and bats, and will be conducted prior to each phase of construction that involves the use of heavy equipment. If an active raptor nest or bat maternity roost is found, no construction activity will occur within 1,200 feet of these areas, which will be monitored by the BM. Construction activities and timing may be modified to avoid impacts to these species.
2. To further minimize potential impacts to foraging raptors and bats, design features may include the following:
  - a. All overhead power lines will be equipped with raptor perch guards. This will minimize perching locations and electrocution hazards to birds (CEC, 1995).

- b. Overhead power lines appropriately spaced to minimize the potential of raptor electrocution using the latest APLIC (2005) recommended guidelines for line spacing.
  - c. USFWS-approved bird flight diverters installed on the new power lines. The diverters will be installed per manufacturer's specifications; replaced when damaged or deemed defective; and maintained for the full length of the transmission line for the life of the facility.
  - d. Shielded lighting consisting of sodium bulbs that are directed downward to reduce light pollution and potential for avian and bat attraction and collision.
3. A threshold of significance for raptor/migratory bird (species protected under the MBTA and the BGEPA) mortality will be established. Monthly post-mortality surveys for such species will be conducted by the AB or BM during the first year of project operation. If this threshold of significance is met or exceeded, adaptive management practices will be implemented to reduce such impact. Based on the results of these monthly post-mortality surveys, it will be determined if these surveys are to continue after the initial year.

#### ***Mitigation Measure 9 – American Badger***

1. The ABs and BMs will perform a preconstruction survey, concurrent with the desert tortoise clearance survey, for badger dens in the project area, including areas within 250 feet of all project facilities, utility corridors, and access roads. If badger dens are found, each den will be classified as inactive, potentially active, or definitely active.
2. Inactive dens will be excavated by hand and backfilled to prevent reuse by badgers.
3. Potentially and definitely active dens will be monitored by the BM for 3 consecutive nights using a tracking medium (such as diatomaceous earth or fire clay) at the entrance. If no tracks are observed in the tracking medium after 3 nights, the den will be excavated and backfilled by hand. If tracks are observed, the den will be progressively blocked with natural materials (rocks, dirt, sticks, and vegetation piled in front of the entrance) for the next 3 to 5 nights to discourage the badger from continued use. The den will then be excavated and backfilled by hand to ensure that no badgers are trapped in the den. This will be performed outside of the breeding season to ensure young are not affected.

### **5.2.12 Involved Agencies and Agency Contacts**

Involved agencies and agency contacts are listed in Table 5.2-14.

### **5.2.13 Permits Required and Permit Schedule**

Required permits and permit schedule are listed in Table 5.2-15.

### **5.2.14 References**

Arizona Natural Heritage Program. 2007. Tracking list of at-risk plants in Arizona. Accessed at: [http://www.azgfd.gov/w\\_c/edits/documents/eocard.species.pdf](http://www.azgfd.gov/w_c/edits/documents/eocard.species.pdf)



Averill-Murray, R.C. 2001. Program MARK survival analysis of tortoises voiding their bladders during handling. Proceeding of the 2001 Desert Tortoise Council Symposium. p. 48.

Avian Power Line Interaction Committee (APLIC) of the Edison Institute and United States Fish and Wildlife Service. 2005. Avian Protection Plan (APP) Guidelines.

Baldwin, B., S. Boyd, B. Ertter, R.W. Patterson, T.J. Rosatti and D.H. Wilken. 2002. The Jepson Desert Manual. University of California Press, Berkeley.

Benson, L. 1969. The Native Cacti of California. Stanford University Press. Stanford, California.

\_\_\_\_\_. 1982. The Cacti of the United States and Canada. Stanford University Press. Stanford, California.

Berry, K.H. 1985. Avian predation on the desert tortoise (*Gopherus agassizii*) in California.

Bittman, Roxanne. Botanist, California Natural Diversity Database, Sacramento, California. Personal communications via email to Ann Howald, June 29, July 2 to 3, 2007.

Blythe, A.K., D.E. Swann, R.J. Steidl, and E.W. Stitt. 2003. Movement patterns of translocated desert tortoises. Proceeding of the 2003 Desert Tortoise Council Symposium. p. 81.

Boarman, W. I. 2002. Reducing predation by common ravens on desert tortoises in the Mojave and Colorado Deserts. Unpublished report prepared for the Bureau of Land Management. July 18, 2002. 33 pp.

Britton and Rose. 1923. The Cactaceae. 4:43, Figure 42.

Brooks, M.L., T.C. Esque, and J.R. Matchett. 2003. Current status and management of alien plants and fire in desert tortoise habitat. Proceedings of the 2003 Desert Tortoise Council Symposium. page 82.

Bury, R.B., R.A. Luckenbach, and S.D. Busak. 1977. Effects of off-road vehicles on vertebrates in the California desert. U. S. Department of the Interior, Wildlife Research Report 8, Washington, D.C.

CalFlora: Information on California plants for education, research, conservation. 2006. Berkeley, California. The CalFlora Database: <http://www.calflora.org/>

California Department of Fish and Game (CDFG). 1995. Staff Report on Burrowing Owl Mitigation. Memorandum Prepared by the California Department of Fish and Game. October 17.

\_\_\_\_\_. 2000. Guidelines for assessing the effects of proposed projects on rare, threatened and endangered plants and natural communities. May 8, 2000. Available at: <http://www.dfg.ca.gov/whdab/pdfs/guideplt.pdf>

\_\_\_\_\_. 2003. CNDDDB. Biogeographic Data Branch. The Vegetation Classification and Mapping Program. List of California Terrestrial Natural Communities Recognized by the California Natural Diversity Database. September 2003 Edition.

\_\_\_\_\_. 2007a. State and federally listed endangered, threatened and rare plants of California. Accessed at: <http://www.dfg.ca.gov/hcpb/species/lists.shtml>

California Department of Food and Agriculture. 2007. List of noxious weeds.

California Department of Transportation. 2004. Interstate 15 Major Improvements-Summer 2002-Winter 2009 map. (<http://www.dot.ca.gov/dist8/projects/15/I-15%20Brstw%20-STLN.rev%206-2004%20copy.pdf>)

California Energy Commission (CEC). 1995. Avian Collision and Electrocution: An Annotated Bibliography. California Energy Commission. pp. 114

California Invasive Plant Council (Cal-IPC). 2006. California Invasive Plant Inventory. Cal-IPC Publication 2006-02. California Invasive Plant Council, Berkeley. Available at: [www.cal-ipc.org](http://www.cal-ipc.org)

California Native Plant Society (CNPS). 2001. Inventory of rare and endangered plants of California. California Native Plant Society. Special Publication #1, Sixth Edition.

\_\_\_\_\_. 2007. Inventory of rare and endangered plants of California (online edition, version 7.07c). Accessed at: <http://www.cnps.org/inventory>

California Natural Diversity Database (CNDDDB). 2003. State and Federally Listed Endangered, Threatened and Rare Animals of California. Habitat Conservation Division Wildlife and Habitat Data Analysis Branch. April.

\_\_\_\_\_. 2007. California Natural Diversity Database, Biogeographic Data Branch, Department of Fish and Game. March 3, 2007 (Version 3.1.0). Species accounts, and Data Base search for the following 7.5-minute USGS quadrangles: Ivanpah Lake, State Line Pass, Mesquite Lake, Clark Mountain, Mescal Range, Mineral Hill, Nipton, and Desert

\_\_\_\_\_. 2007a. Special vascular plants, bryophytes and lichens list. Accessed at: [www.dfg.ca.gov/whdab/pdfs/spplants.pdf](http://www.dfg.ca.gov/whdab/pdfs/spplants.pdf)

\_\_\_\_\_. 2007c. Backlog data on *Agave utahensis* var. *nevadensis*, *Coryphantha chlorantha*, *Cynanchum utahense*, *Mortonia utahensis* and *Penstemon bicolor* ssp. *roseus*. Hardcopy files reviewed at the CNDDDB offices at 1807 13th Street, Suite 202, Sacramento.

Clark County Conservation of Public Land and Natural Resources Act of 2002, Pub. L. 107-282 § 501 (2002).

Clark County Department of Aviation. 2004. Conceptual Drainage Study for Ivanpah Valley International Airport. Prepared by G.C. Wallace, Inc. January 2004.

\_\_\_\_\_. 2006. Project Definition and Justification, Proposal to Construct and Operate a New Supplemental Commercial Service Airport in the Ivanpah Valley. August 2006

County of San Bernardino County. 2007. County General Plan.

Desert Tortoise Council. 1994 (Revised 1999). Guidelines for Handling Desert Tortoises during Construction Projects. Edward L. LaRue, Jr., editor. Wrightwood, California.

Eddleman, W. R. 2002. Hepatic Tanager (*Piranga flava*). In *The Birds of North America*, No. 655 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Evans, R. 2001. Free-roaming dog issues at the United States Marine Corps Air Ground Combat Center, Twentynine Palms, California. Proceedings of the 2001 Desert Tortoise Council Symposium. p. 6 1.

Federal Railroad Administration. 2006. DesertXpress High Speed Train Linking Victorville, CA and Las Vegas, NV.

([http://www.fra.dot.gov/downloads/rrdev/desert\\_express\\_mailer\\_08\\_c.pdf](http://www.fra.dot.gov/downloads/rrdev/desert_express_mailer_08_c.pdf))

\_\_\_\_\_. 2007. <http://www.fra.dot.gov/us/content/1703>.

Flora of North America. 2007. Electronic flora. Species account for *Coryphantha chlorantha*. Accessed at: [www.eFloras.org](http://www.eFloras.org)

Garrett, K., and J. Dunn. 1981. Birds of southern California. Los Angeles Audubon Soc. 408 pp.

Grant, Colin. 2007. Bureau of Land Management. Weed Control Specialist. Needles District. Conversation with Amy Hiss regarding invasive weeds. August 15.

Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna No. 27. 608 pp.

Holland, R. F. 1986. Preliminary descriptions of the terrestrial natural communities of California. California Department of Fish and Game. Unpublished report.

Illia, Tony. 2005. "New federal funds revive Maglev project." Las Vegas Business Press. August 22. On the internet at:  
<http://www.lvbusinesspress.com/articles/2005/08/22/news/news02.txt>

Jepson Online Interchange. 2007. Consortium of California Herbaria on-line database. Accessed at: <http://ucjeps.berkeley.edu/interchange.html>

Jepson, W.L. 1909. A flora of California, Vol. I, page 543. Accessed at:  
[http://bscit.berkeley.edu/cgi-bin/display\\_page?page=547&elib\\_id=3062&format=jpeg](http://bscit.berkeley.edu/cgi-bin/display_page?page=547&elib_id=3062&format=jpeg)

Johnson, N. K. 1976. Breeding distribution of Nashville and Virginia's warbler. Auk 55:176-178.

Kartesz, J.K. 1988. A flora of Nevada. Ph.D. Dissertation, University of Nevada, Reno.

Keeler-Wolf, Todd. Vegetation Ecologist with the CNDDDB, Sacramento, California. Personal communication with Amy Hiss 14 August 2007.

Kerlinger, Paul. 2000. Avian Mortality at Communication Towers: A Review of the Recent Literature, Research, and Methodology. Prepared for the U.S. Fish and Wildlife Service Office of Migratory Bird Management. 38 pp.

"KVBC Las Vegas Story - A new train passage to southern California proposed," KVBC Television. Las Vegas, Nevada, July 25, 2006.  
[http://www.kvbc.com/Global/story.asp?S=5167300&nav=menu107\\_4](http://www.kvbc.com/Global/story.asp?S=5167300&nav=menu107_4).

Luckenbach, R. A. 1982. Ecology and management of the Desert Tortoise (*Gopherus agassizii*) in California. Pages 1-37 in R.B. Bury, ed., North American Tortoise and Conservation Ecology. U.S. Department of Interior, Fish and Wildlife Service, Wildlife Research Report 12.

Marcel, Fredrick. 2007. Real Estate Specialist, U.S. Bureau of Land Management, Las Vegas Field Office with Lyna Black, CH2M HILL. August 2, 2007.

McCaskie, G., P. De Benedictis, R. Erickson, and J. Morlan. 1979. Birds of northern California, an annotated field list. 2nd ed. Golden Gate Audubon Soc., Berkeley. 84 pp.

\_\_\_\_\_. 1988. Birds of northern California, an annotated field list. 2nd ed. Golden Gate Audubon Soc., Berkeley. Reprinted with suppl. 108 pp.

Mojave Resource Conservation District. Mojave Weed Management Area – Long Range Plan. August 6, 2003.

Morefield, James, Ph.D. 2007. Botanist, Nevada Natural Heritage Program, Carson City, Nevada. Personal communication via electronic mail to Ann Howald, 3 July 2007.

Mozingo, H.N. and M. Williams. 1980. Threatened and endangered plants of Nevada. Funded by U.S. Fish and Wildlife Service and U.S. Bureau of Land Management.

National Oceanographic and Atmospheric Administration (NOAA), National Weather Service. 2007. Climate of Las Vegas, Nevada. Accessed at:  
<http://www.wrh.noaa.gov/vef/climate/index.php>

Natural Resources Conservation Service (NRCS), United States Department of Agriculture. 2007. Official Soil Series Descriptions. Accessed at:  
<http://soils.usda.gov/technical/classification/osd/index.html>“.

NatureServe. 2007. Natural heritage methodology. Accessed at:  
<http://www.natureserve.org/prodServices/heritagemethodology.jsp>

Nevada Native Plant Society. 2007. Nevada Native Plant Society Status Lists, March 2007. Accessed at: <http://heritage.nv.gov/lists/nnpstat.pdf>

Nevada Power. 2007. Accessed at  
<http://www.nevadapower.com/centennial/details/transmission.cfm>.

Newsome, Suzanne. 2007. Las Vegas Valley Water District. Personal Communication, July, 2007.

Nicholson, L. 1978. The effects of roads on desert tortoise populations. Proceedings of the 1978 Desert Tortoise Council Symposium 1978:127-129.

O’Connell, Kathleen. 2007 Real Estate Specialist. Bureau of Land Management. Personal Communication with Lyna Black, CH2M HILL. August 2, 2007.

O’Conner, M.P., L.C. Zimmerman, D.E. Ruby, S.J. Bulova, and J.R. Spotila. 1994. Home range size and movements by desert tortoise, *Gopherus agassizii*, in eastern Mojave Desert. Herpetology Monographs. Volume 8. 60-71 pp.

Reiser, C.H. 1994. Rare plants of San Diego County. On-line version. Accessed at:  
<http://sandiego.sierraclub.org/rareplants/077.html>

Remsen, J. V., Jr. 1978. Bird species of special concern in California. Calif. Dept. of Fish and Game, Sacramento. Wildl. Manage. Admin. Rep. No. 78-1. 54 pp.

- Rostral, D.C., V.A. Lance, J.S. Grimbles, and A.C. Alberts. 1994. Seasonal reproductive cycle of the desert tortoise (*Gopherus agassizii*) in eastern Mojave Desert. *Herpetology Monographs*. Volume 8. 72-102 pp.
- Sawyer, J. and T. Keeler-Wolf. 1995. A manual of California vegetation. California Native Plant Society, Sacramento.
- Shreve, Forrest, and Ira L. Wiggins. 1964. Vegetation and flora of the Sonoran Desert. Volume One. Stanford University Press, Stanford, California.
- Skinner, M.W. and B.M. Pavlik (eds). 1994. Inventory of Rare and Endangered Vascular Plants of California. California Native Plant Society Special Publication No. 1 (Fifth edition). Sacramento, California. 338 pp.
- Stebbins, R.C. 1985. Peterson Field Guides: Western Reptiles and Amphibians. Houghton Mifflin Company, Boston, Massachusetts.
- Stutz, Howard. 2007. Nevada Landing about to sink. Las Vegas Review-Journal.
- Sullivan, Charles. 2007. Bureau of Land Management. Wildlife Biologist. Needles District. Conversation with Amy Hiss regarding invasive weeds. August 15.
- Thorne, R.F., B.A. Prigge and J. Henrickson. 1981. A flora of the higher ranges and the Kelso Dunes of the Eastern Mojave Desert in California. *Aliso* 10(1):71-186. Rancho Santa Ana Botanic Garden, Claremont, Calif. Reprint published by Southern California Botanists, Dec. 1981.
- Torre, Alicia. 2007. Consultant to BrightSource Energy. Personal Communication (email). August 2, 2007.
- U.S. Bureau of Land Management (BLM). 1980 (Amended 1999). California Desert Conservation Area Plan. Prepared by the Bureau of Land Management Sacramento Office. August 17.
- \_\_\_\_\_. 1986. Incidence of gunshot deaths in desert tortoise (*Gopherus agassizii*) populations in California. *Wildlife Society Bulletin* 14: 127-32.
- \_\_\_\_\_. 1990. Draft raven management plan for the California Desert Conservation Area. Prepared by Bureau of Land Management, California Desert District, Riverside, California. April 1990.
- \_\_\_\_\_. 2001. Salvaging injured, recently dead, ill, and dying wild, free-roaming desert tortoises (*Gopherus agassizii*). Protocol prepared for Fish and Wildlife permit TE006556-11. June.
- \_\_\_\_\_. 2002. Final Environmental Impact Statement Table Mountain Wind Generating Facility. July 2002. (<http://sandyvalley.us/node/143>)
- \_\_\_\_\_. 2002. Northern and Eastern Mojave Desert Management Plan. Prepared by the Bureau of Land Management California Desert District Office. December 20.
- \_\_\_\_\_. 2004. List of California-BLM sensitive plants. April 2004.
- \_\_\_\_\_. Undated. Le Conte's Thrasher. Unpublished Document by B.G. Prescott.

U.S. Department of Transportation. 2004. Federal Register, Volume 69, Number 98. May 20, 2004. (<http://www.fra.dot.gov/downloads/rrdev/vegasnoi.pdf>)

U.S. Environmental Protection Agency: August 24, 2001, Federal Register. (Volume 66, Number 165), Page 44617-44620.

\_\_\_\_\_. 2002. Federal Register: January 30, 2002, Volume 67, Number 20 (<http://www.epa.gov/fedrgstr/EPA-IMPACT/2002/January/Day-30/i2195.htm>)

U.S. Fish and Wildlife Service (USFWS). 1970. Federal Register, Department of the Interior, Fish and Wildlife Service. United States List of Endangered Fish and Wildlife. 50 CFR Part 17. 35 FR 16047-16048. October 13.

\_\_\_\_\_. 1990a. Federal Register, Department of the Interior, Fish and Wildlife Services. Final Listing. ETWP; Determination of Threatened Status for the Mojave Population of the Desert Tortoise; 50 CFR Part 17. 55 FR 12178-12191. April 2.

U.S. Fish and Wildlife Service (USFWS). 1990b. Procedures for Endangered Species Act Compliance for the Mojave Desert Tortoise. U.S. Fish and Wildlife Service, Portland, Oregon.

\_\_\_\_\_. 1992. Field Survey Protocol for Any Federal Action That May Occur within the Range of the Desert Tortoise. January.

\_\_\_\_\_. 1994a. Federal Register, Department of the Interior, Fish and Wildlife Services. Rules and Regulations. Determination of Critical Habitat for the Mojave Population of the Desert Tortoise; Final Rule. 50 CFR Part 17. 59 FR 5820-5866. February 8.

\_\_\_\_\_. 1994b. Desert Tortoise (Mojave population) Recovery Plan. Portland, Oregon. 73 pages plus appendices.

\_\_\_\_\_. 1995. Endangered and threatened wildlife and plants; 90-day finding for a petition to list the Mohave ground squirrel as threatened. Federal Register Vol. 60 No. 173, p. 46569- 46571. September 7, 1995.

\_\_\_\_\_. 1996a. Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants. USFWS, September 23, 1996. Available at: [http://www.fws.gov/sacramento/es/documents/listed\\_plant\\_survey\\_guidelines.htm](http://www.fws.gov/sacramento/es/documents/listed_plant_survey_guidelines.htm)

\_\_\_\_\_. 1996b. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates for Listing as Endangered or Threatened Species; Notice of Review; Proposed Rule. Federal Register 61(40): 7596-7613.

\_\_\_\_\_. 2006. List of federal candidates for listing, available at: <http://ecos.fws.gov/endangered/candidates/index.html>

Utah Division of Wildlife Resources. 1998. Inventory of sensitive species and ecosystems in Utah. Endemic and rare plants of Utah: an overview of their status and distribution.

Prepared for Utah Reclamation Mitigation and Conservation Commission and the U.S. Dept. of the Interior. Accessed at: <http://dwrcdc.nr.utah.gov/ucdc/ViewReports/plantrpt.pdf>

Utah Native Plant Society. 2007. Utah Rare Plant Guide. Accessed at: [http://www.utahrareplants.org/rpg\\_species.html](http://www.utahrareplants.org/rpg_species.html)

Von Der Lippe, Moritz and Ingo Kowarik. 2007. Long-Distance Dispersal of Plants by Vehicles as a Driver of Plant Invasions. *Conservation Biology* Volume 21, No. 4, 986-996. Institute of Ecology, Technical University of Berlin, Rothenburgstr.12, D-12165 Berlin, Germany.

Weisenberger, M. E. 1996. Effects of simulated jet aircraft noise on heart rate and behavior of desert ungulates. *Journal of Wildlife Management* 60, no. (1): 52-61.

Williams, Terry. 2007. Land Use Tech, San Bernardino County Planning Department. Personal communication with Lyna Black, CH2M HILL. August 2, 2007.

Woodbury, A.M. and R. Hardy. 1940. The dens and behavior of the desert tortoise. *Science*. December 6. 529 pp.

Woodbury, A.M. and R. Hardy. 1948. Studies of the desert tortoise, *Gopherus agassizii*. *Ecology Monographs*. Volume 18, Number 2. 145-200 pp.

Zeiner, D.C, W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1990a. California's Wildlife, Volume 2: Birds. California Department of Fish and Game, Sacramento.

\_\_\_\_\_. 1990b. California's Wildlife, Volume 3: Mammals. California Department of Fish and Game, Sacramento.

\_\_\_\_\_. 1990c. California's Wildlife, Volume 1: Amphibians. California Department of Fish and Game, Sacramento.

Zimmerman, Allan Dale. 1985. Systematics of the genus *Coryphantha* (Cactaceae), Ph.D. dissertation. The University of Texas at Austin, August 1985.

Zouhar, Kris 2003. Tamarix spp. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available at: <http://www.fs.fed.us/database/feis/>





TABLE 5.2-1  
Laws, Ordinances, Regulations, and Standards for Biological Resources

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
<b>Federal</b>			
Endangered Species Act of 1973 Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.)	Designates and protects federally threatened and endangered plants and animals and their critical habitat.	USFWS	A biological assessment (BA) will be prepared based on the desert tortoise protocol survey results. No critical habitat has been designated in the project area. BLM will initiate formal Section 7 consultation with the USFWS.
Section 404 of Clean Water Act of 1977 (33 USC §1344).	Requires permit to dredge or fill jurisdictional wetlands or waters of the U.S.	USACE	It is anticipated that the USACE will take jurisdiction of the ephemeral washes that drain into Ivanpah Dry Lake. A permit will be needed prior to any dredge or fill activities.
Section 401 of Clean Water Act of 1977	Requires water quality impact analysis for the project when using 404 permits and for discharges to waterways.	RWQCB	It is anticipated that the Lahontan RWQCB will require a 401 Certification for discharges into the ephemeral washes that drain into Ivanpah Dry Lake.
Migratory Bird Treaty Act of 1918 (16 USC §§703-711)	Prohibits the non-permitted take of migratory birds.	USFWS	Project owner will avoid take of migratory birds by implementing avoidance and protection measures.
Bald and Golden Eagle Protection Act of 1940 (16 USC 668).	Prohibits the non-permitted take of bald and golden eagles.	USFWS	Project owner will avoid take of eagles by implementing avoidance and protection measures.
<b>State</b>			
California Environmental Quality Act of 1970 (Public Resources Code §§21000 et seq.).	Sets goals to assist California public agencies in identifying potential significant environmental effects of their actions and either avoiding or mitigating those effects when feasible.	CEC	CEC is the state lead agency and will prepare the necessary CEQA documentation.
Warren Alquist Act of 2005 (Public Resources Code §§25000 et seq.).	A CEQA-equivalent process implemented by the CEC.	CEC	Preparation of this application will result in an assessment prepared by the CEC staff to fulfill the requirements of CEQA.
California Endangered Species Act of 1984 (Fish and Game Code, §2050 through §2098)	Protects California's endangered and threatened species.	CDFG	It is anticipated that the CDFG will issue a 2081 permit for the desert tortoise.

TABLE 5.2-1  
Laws, Ordinances, Regulations, and Standards for Biological Resources

LORS	Requirements/ Applicability	Administering Agency	AFC Section Explaining Conformance
Fish and Game Code Fully Protected Species (§3511: Fully Protected birds, §4700: Fully Protected mammals, §5050: Fully Protected reptiles and amphibians, §5515: Fully Protected fishes)	Prohibits the taking of plants and animals that are Fully Protected in California.	CDFG	Project owner will avoid take of fully protected species by implementing avoidance and protection measures
Fish and Game Code §1930, Significant Natural Areas (SNAs)	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. Listed in the CNDDB.	CDFG	There are no SNAs in the project area.
Fish and Game Code §1580, Designated Ecological Reserves (DERs)	The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study.	CDFG	There are no DERs in the project area.
Fish and Game Code §1600, Streambed Alteration Agreement (SAA)	Reviews projects for impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	CDFG	It is anticipated that the CDFG will take jurisdiction of the ephemeral washes that drain into Ivanpah Dry Lake. A SAA may be needed prior to any alteration of the drainages.
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	Designates state rare and endangered plants and provides specific protection measures for identified populations.	CDFG	Project owner will minimize or mitigate impacts to rare plant species by implementing minimization measures.
Public Resources Code §§25500 & 25527	Siting of facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value is prohibited or when no alternative, strict criteria is applied.	CDFG	No areas of critical biological concern in project area.
Title 20 CCR §§1702 (q) and (v)	Protects “areas of critical concern” and “species of special concern” identified by local, state, or federal resource agencies in the project area, including the California Native Plant Society (CNPS).	CDFG	No areas of critical concern in project area.
Title 14 CCR Section 15000 et seq.	Describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site.	CEC	AFC provides this information.

TABLE 5.2-2  
Vegetation Types Within Project Sites and Buffers

Project Feature	Vegetation Type Present
<b>Site Feature</b>	
Ivanpah 1 <sup>a</sup>	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Cheesebush-Dominated Washes
Ivanpah 2 <sup>a</sup>	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Cheesebush-Dominated Washes Mojave Wash Scrub
Ivanpah 3 <sup>a</sup>	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Creosote Bush Scrub: Larrea-Mixed Subtype <sup>d</sup> Mojave Wash Scrub Cheesebush-Dominated Washes
North Gas Line	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Mojave Wash Scrub Cheesebush-Dominated Washes
Road Segments A, B, C, Southern Gas Line, Substation, and Administration Building <sup>b</sup>	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup>
Colosseum Road	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Cheesebush-Dominated Washes
<b>One Mile Buffer</b>	Creosote Bush Scrub: Larrea-Ambrosia Subtype <sup>d</sup> Creosote Bush Scrub: Larrea-Mixed Subtype <sup>d</sup> Cheesebush-Dominated Washes Mojave Wash Scrub
Metamorphic Hill <sup>c</sup>	Creosote Bush Scrub: Larrea Scrub – Subtype <sup>d</sup>
Limestone Hill <sup>c</sup>	Creosote Bush Scrub: Limestone-Associated Larrea Scrub Subtype <sup>d</sup>
Limestone Pavement Plain <sup>c</sup>	Mojave Yucca – Nevada Ephedra Scrub
Limestone Ridge and Knob <sup>c</sup>	Creosote Bush Scrub: Limestone-Associated Larrea Scrub Subtype <sup>d</sup>

Notes:

<sup>a</sup> Including the 250-foot buffer

<sup>b</sup> Portions of these features were redesigned after the surveys were complete; therefore, some of these areas were not included in 2007 surveys. Pre-construction surveys will be conducted in any unsurveyed areas to determine if there are any special-status plants present. Based on the habitats present within these areas, the likelihood that small numbers of desert pincushion and the Parish club-cholla would occur, similar to adjacent surveyed areas, is high. Because the perennial base of *Penstemon* was observable during the 2007 surveys, and they were only found in the north part of the project area, it is not expected that species of *Penstemon* would occur in these unsurveyed areas.

<sup>c</sup> Feature is located within the one-mile buffer

<sup>d</sup> Associated with the natural community type called the Creosote Bush - White Bursage - Barrel Cactus (*Larrea tridentata*-*Ambrosia dumosa*-*Echinocactus polycephalus* - \*33.140.33) plant community (Pers. Comm, Keeler-Wolf, 2007; CNDDDB 2003).

TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group		Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		
Family									
Species <sup>1</sup>	Common Name	MCBS	MWS	Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	Habit
Ferns									
Pteridaceae	Brake Family								
<i>Cheilanthes parryi</i>	Parry cloak fern						o		fern
Gymnosperms (Conifers)									
Ephedraceae	Ephedra Family								
<i>Ephedra nevadensis</i>	Nevada ephedra	1, 2, 3	3		x	x	x o	x	shrub
<i>Ephedra funerea</i>	Death Valley ephedra	1, 2, 3			x		x o		shrub
Dicot Angiosperms (Flowering Plants)									
Apocynaceae	Dogbane Family								
<i>Amsonia tomentosa</i>	woolly amsonia	1, 3	3		x				perennial
Asclepiadaceae	Milkweed Family								
<i>Asclepias nyctaginifolia</i>	Mojave milkweed	1							perennial
<i>Cynanchum utahense</i>	Utah vine milkweed	1							perennial
Asteraceae	Sunflower Family								
<i>Acamptopappus sphaerocephalus</i>	goldenhead	1							shrub
<i>Adenophyllum cooperi</i>	Cooper dyssodia	1, 2, 3							perennial
<i>Ambrosia dumosa</i>	burrobush	1, 2, 3	3	x	x	x	x o	x o	shrub
<i>Ambrosia eriocentra</i>	woolly bursage	3	3						shrub
<i>Baileya multiradiata</i> var. <i>m.</i>	desert-marigold	1, 3			x				annual
<i>Bebbia juncea</i> var <i>aspera</i>	sweetbush		3						shrub
<i>Brickellia arguta</i> var. <i>a.</i>	spearleaf brickellbush	3					o	o	shrub
<i>Brickellia</i> cf. <i>californica</i>	California brickellbush	3					o	o	shrub
<i>Brickellia incana</i>	woolly brickellbush	1, 2		x					shrub
<i>Chrysothamnus paniculatus</i>	black-banded rabbitbrush	2	3	x					shrub
# <i>Encelia farinosa</i>	brittlebush				x				shrub

TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group			Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		
Family										
	Species <sup>1</sup>	Common Name	MCBS	MWS	Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	Habit
	<i>Encelia virginensis</i>	Virgin River brittlebush	1, 2, 3	3		x	x	x o		shrub
	<i>Ericameria cooperi</i> var. <i>c.</i>	Cooper goldenbush	1, 2, 3		x			x		shrub
	<i>Gutierrezia microcephala</i>	sticky snakeweed	3					x o		shrub
	<i>Hymenoclea salsola</i>	cheesebush	1, 2, 3	3	x	x	x	x		shrub
	<i>Porophyllum gracile</i>	slender poreleaf	1, 2, 3	3		x		x	x	perennial
	<i>Psilostrophe cooperi</i>	paper-daisy	1, 3							subshrub
	<i>Rafinesquia neomexicana</i>	desert chicory	3							annual
	<i>Senecio flaccidus</i> var. <i>monoensis</i>	sand-wash groundsel	1, 2, 3	3						subshrub
d	<i>Stephanomeria exigua</i>	small wirelettuce	2							annual
	<i>Stephanomeria pauciflora</i> var. <i>p.</i>	wire-lettuce	1, 2, 3	3	x	x	x	o	x	perennial
	<i>Viguiera parishii</i>	Parish golden-eye				x				shrub
	<i>Xylorhiza tortifolia</i>	Mojave aster	3						x	perennial
Bignoniaceae		Bignonia Family								
	<i>Chilopsis linearis</i>	desert-willow		3						shrub/tree
Boraginaceae		Borage Family								
d	<i>Amsinckia tessellata</i>	checker fiddleneck	3							annual
	<i>Cryptantha angustifolia</i>	narrow-leaved cryptantha			x					annual
d	<i>Cryptantha</i> sp.	cryptantha	1, 2, 3					o	o	annual
	<i>Cryptantha</i> sp. 1	cryptantha							o	annual
	<i>Pectocarya platycarpa</i>	broad-fruited combseed			x					annual
Brassicaceae		Mustard Family								
d	<i>Descurainia pinnata</i>	tansy mustard	1, 2, 3		x					annual
	<i>Lepidium fremontii</i>	desert alyssum	1, 3	3						subshrub
	<i>Lepidium lasiocarpum</i> var. <i>l.</i>	modest peppergrass	2		x					annual
*	<i>Sisymbrium</i> cf. <i>irio</i>	London rocket			x					annual
d	<i>Streptanthella longirostris</i>	long-beaked twist flower	1							annual
Buddlejaceae		Buddleja Family								
	<i>Buddleja utahensis</i>	Panamint butterfly bush						o		shrub

TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group		Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		
Family									
Species <sup>1</sup>	Common Name	MCBS	MWS	Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	Habit
Cactaceae	Cactus Family								
<i>Coryphantha chlorantha</i>	desert pincushion	1, 2, 3			x				shrub
<i>Echinocactus polycephalus</i>	clustered barrel cactus	1, 2, 3			x	x	x o	o	shrub
<i>Echinocereus engelmannii</i>	hedgehog cactus	1, 2, 3			x	x	x o	x o	shrub
<i>Ferocactus cylindraceus</i> var. <i>lecontei</i>	California barrel cactus	1, 2, 3			x	x	o	x o	shrub
<i>Mammillaria tetrancistra</i>	fish-hook cactus	1, 2, 3							shrub
<i>Opuntia acanthocarpa</i> var. <i>coloradensis</i>	buckhorn cholla	1, 2, 3	3	x	x	x	x o	x o	shrub
<i>Opuntia basilaris</i> var. <i>b.</i>	beavertail cactus	1, 2, 3		x	x	x	x		shrub
<i>Opuntia chlorotica</i>	pancake prickly-pear	3							shrub
<i>Opuntia echinocarpa</i>	silver cholla	1, 2, 3		x	x	x	x	x o	shrub
<i>Opuntia echinocarpa</i> x <i>O. ramosissima</i>	hybrid silver x pencil cholla	3							shrub
<i>Opuntia erinacea</i>	Mojave prickly-pear	2, 3							shrub
<i>Grusonia [Opuntia] parishii</i>	Parish club-cholla	1, 3				x			shrub
<i>Opuntia ramosissima</i>	pencil cholla	1, 2, 3	3	x	x	x	x o		shrub
Chenopodiaceae	Goosefoot Family								
<i>Atriplex canescens</i> ssp. <i>c.</i>	fourwing saltbush	3							shrub
Euphorbiaceae	Spurge Family								
<i>Chamaesyce albomarginata</i>	rattlesnake weed	1, 2, 3	3	x					perennial
Fabaceae	Legume Family								
<i>Acacia greggii</i>	catclaw acacia	1, 2, 3	3		x		o		shrub
Geraniaceae	Geranium Family								
* <i>Erodium cicutarium</i>	red-stemmed filaree	2		x					annual
Hydrophyllaceae	Waterleaf Family								
<i>Phacelia perityloides</i>	cliff phacelia						o		perennial
Krameriaceae	Rhatany Family								
<i>Krameria erecta</i>	pima ratany	1, 2, 3		x	x	x	x o	x o	shrub
Lamiaceae	Mint Family								
<i>Salazaria mexicana</i>	Mexican bladder sage	1, 2, 3	3				x o		shrub

TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group		Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		
Family									
Species <sup>1</sup>	Common Name	MCBS	MWS	Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	Habit
<i>Salvia dorrii</i>	blue sage	1, 3	3		x		x o		shrub
Loasaceae	Loasa Family								
<i>Eucnide urens</i>	rock nettle						o		shrub
<i>Petalonyx thurberi</i> ssp. <i>t.</i>	Thurber sandpaper plant	2, 3	3						shrub
Malvaceae	Mallow Family								
<i>Sphaeralcea ambigua</i>	apricot mallow	1							perennial
Nyctaginaceae	Four O'clock Family								
<i>Mirabilis</i> sp.	four o'clock	1, 2							perennial
Oleaceae	Olive Family								
<i>Menodora spinescens</i>	spiny menodora	1, 2, 3					x o		shrub
Onagraceae	Evening Primrose Family								
<i>d Camissonia boothii</i>	woody bottle-washer	1, 2, 3			x			x	annual
Polemoniaceae	Phlox Family								
<i>Eriastrum eremicum</i> ssp. <i>e.</i>	desert woolly star	1, 2							annual
Polygonaceae	Buckwheat Family								
<i>Chorizanthe brevicornu</i>	brittle spineflower	1, 2							annual
<i>d Chorizanthe rigida</i>	rigid spiny-herb	1, 2, 3		x	x		x	x	annual
<i>d Eriogonum deflexum</i>	flat-topped buckwheat	3							annual
<i>Eriogonum fasciculatum</i> ssp. <i>polifolium</i>	Mojave Desert California buckwheat	1, 2, 3	3		x	x	x o	x o	shrub
<i>Eriogonum inflatum</i> var. <i>i.</i>	desert trumpet	1, 2, 3			x	x	x o	x o	perennial
<i>d Eriogonum nidularium</i>	birdnest buckwheat	3							annual
<i>d Eriogonum</i> sp.	annual buckwheat	3							annual
<i>d Eriogonum trichopes</i>	little desert trumpet	1, 2, 3			x				annual
Rosaceae	Rose Family								
<i>Coleogyne ramosissima</i>	blackbush	1, 3					o		shrub
<i>Prunus fasciculata</i>	desert almond	1, 2, 3	3				x o		shrub
Rutaceae	Rue Family								

TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group		Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		Habit
Family	Species <sup>1</sup>	MCBS	MWS	Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	
	<i>Thamnosma montana</i>	3					o		shrub
Scrophulariaceae									
	Figwort Family								
	<i>Penstemon palmeri</i> or <i>bicolor</i>		3		x				perennial
Solanaceae									
	Nightshade Family								
	<i>Lycium andersonii</i>	1, 2, 3	3	x			x o	x o	shrub
	<i>Lycium cooperi</i>	1, 2, 3		x			x o		shrub
	<i>Nicotiana obtusifolia</i>	3					o	o	perennial
	<i>Physalis crassifolia</i>							o	perennial
Viscaceae									
	Mistletoe Family								
	<i>Phoradendron californicum</i>	1, 2, 3	3		x	x			parasitic
Zygophyllaceae									
	Caltrop Family								
	<i>Larrea tridentata</i>	1, 2, 3	3	x	x	x	x o	x o	shrub
<b>Monocot Angiosperms (Flowering Plants)</b>									
Liliaceae									
	Lily Family								
	<i>Yucca schidigera</i>	1, 2, 3	3	x	x	x	x o		shrub
Poaceae									
	Grass Family								
	<i>Achnatherum speciosum</i>	3							perennial
	<i>Aristida adscensionis</i>						o	o	annual
	<i>Aristida purpurea</i>						o		perennial
*d	<i>Bromus madritensis</i> ssp. <i>rubens</i>	1, 3		x			x o	x o	annual
	<i>Erioneuron pulchellum</i>	1, 2, 3		x		x	x o	o	perennial
	<i>Pleuraphis rigida</i>	1, 2, 3		x			x	x o	perennial
*d	<i>Schismus</i> sp.	1, 2, 3		x			x	x o	annual



TABLE 5.2-3  
List of Plants Observed - Ivanpah SEGS Project

Plant Group		Ivanpah 1, 2 and 3 <sup>2</sup>		Other Project Areas <sup>3</sup>			Rocky Hills <sup>4</sup>		
Family				Access Road	Utility Line	Sub-station	Lime-stone	Meta-morphic	Habit
Species <sup>1</sup>	Common Name	MCBS	MWS						

#### Notes

<sup>1</sup> \* = introduced species (not native to California)

# = California native species not native to area; probably planted during restoration work on Kern River Pipeline

d = annual species observed only as dead plants from previous year (noted for annual species only)

<sup>2</sup> Species observed in proposed solar array sites were recorded by plant community and by site:

MCBS = Mojave creosote bush scrub plant community; MWS = Mojave wash scrub plant community

1 = species present in the southern site; 2 = species present in the middle site; 3 = species present in the northern site

<sup>3</sup> Other proposed project areas surveyed outside of the solar array sites include:

Access Road = unpaved access road, along Colosseum Road west from the paved golf course road to the junction with the electrical transmission line access road east of the middle site

Utility Line = proposed gas line and transmission line corridor north from northern site, extending to the Kern River Pipeline and electrical transmission lines just north of the pipeline

Substation = proposed electrical substation, storage facility, access roads southwest from Colosseum Road, gas line, and electrical transmission lines located between the middle and southern sites

x = species present in the survey area

<sup>4</sup> Two rocky hills occur near Ivanpah 2 and 3, portions of which occur within the 250-foot buffer zone around the northern site:

Limestone hill = hill of gray limestone located on the west edge of the northern site; an intensive survey was conducted over most of the limestone hill outside of the buffer zone

Metamorphic hill = large hills of red and black metamorphic rock located at the southeastern edge of the northern site and just north and northeast of the middle site; an intensive survey was not conducted of the metamorphic hill outside of the buffer zone, however several areas were observed

x = species present on hill within the northern site 250-foot buffer zone

o = species present on hill outside of the northern site 250-foot buffer zone, and out of the project area

Surveys conducted April 17 through June 9, 2007 in a very dry year.

Nomenclature per the Jepson Desert Manual (Baldwin *et. al.*, 2002).

TABLE 5.2-4  
Potentially Occurring and Observed Invasive Weeds

Scientific Name	Common Name	Observed During Surveys
<i>Ailanthus altissima</i>	tree of heaven	No
<i>Alhagi camelorum</i>	camel thorn	No
<i>Arundo donax</i>	giant reed	No
<i>Brassica tournefortii</i>	sahara mustard	No
<i>Bromus madritensis</i>	red brome	Yes. Widespread - distributed throughout the project area, mostly at the base of shrubs.  CDFA Rank: none; Cal-IPC rating: high.
<i>Centaurea solstitialis</i>	yellow starthistle	No
<i>Halogeton glomeratus</i>	halogeton	No
<i>Linaria dalmatica</i>	dalmation toadflax	No
<i>Pennisetum setaceum</i>	fountain grass	No
<i>Salsola tragus</i>	Russian thistle	No
<i>Schismus</i> spp.	Mediterranean-grass	Yes. Observed patchily distributed throughout the project area.  CDFA Rank: none; Cal-IPC rating: limited.
<i>Solanum elaeagnifolium</i>	white horsenettle	No.
<i>Sisymbrium irio</i>	London rocket	Yes. A few individuals were observed in the vicinity of an existing well on Colosseum Road.  CDFA Rank: none; Cal-IPC rating: moderate.
<i>Tamarix ramosissima</i>	saltcedar	Yes. Five Tamarix sp. observed in the very southeast quadrant of the one mile buffer, east of I-15.  CDFA Rank: B; Cal-IPC rating: high
<i>Tribulus terrestris</i>	puncture vine	No.

**Source:**

California Department of Food and Agriculture (CDFA 2004).

California Invasive Plant Council (Cal-IPC 2006).

Mojave Resource Conservation District. 2003. Mojave Weed Management Plan. August 6.

**Notes:**

CDFA B rated weeds are those for which eradication, containment, control or other holding action is conducted at the discretion of the County Agricultural Commissioner.

**Cal-IPC ratings:**

High – These species have severe ecological impacts on physical processes, plant and animal communities and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed.

Moderate – These species have substantial and apparent – but generally not severe – ecological impacts on physical processes, plant and animal communities and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although establishment is generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

TABLE 5.2-5  
Incidental Observations of Wildlife Species from the 2007 Desert Tortoise Protocol Surveys of the Project Area

Scientific Name	Common Name
<b>BIRDS</b>	
<b>ORDER: CICONIIFORMES</b>	<b>FLAMINGOS, HERONS AND STORKS</b>
<b>Ardeidae</b>	<b>Hérons</b>
<i>Ardea herodias</i>	Great Blue Heron
<b>ORDER: FALCONIFORMES</b>	<b>HAWKS AND VULTURES</b>
<b>Accipitridae</b>	<b>Hawks</b>
<i>Aquila chrysaetos</i>	Golden Eagle
<i>Buteo jamaicensis</i>	Red-tailed Hawk
<b>Falconidae</b>	<b>Falcons</b>
<i>Falco sparverius</i>	American Kestrel
<b>ORDER: COLUMBIFORMES</b>	<b>DOVES AND PIGEONS</b>
<b>Columbidae</b>	<b>Pigeons and Doves</b>
<i>Zenaida macroura</i>	Mourning Dove
<b>ORDER: CAPRIMULGIFORMES</b>	<b>NIGHTJARS</b>
<b>Caprimulgidae</b>	<b>Goatsuckers</b>
<i>Chordeiles acutipennis</i>	Lesser Nighthawk
<b>ORDER: APODIFORMES</b>	<b>HUMMINGBIRDS AND SWIFTS</b>
<b>Apodidae</b>	<b>Swifts</b>
<i>Aeronautes saxatalis</i>	White-throated Swift
<i>Chaetura vauxi</i>	Vaux's Swift
<b>ORDER: PASSERIIFORMES</b>	<b>PASSERINES AND PERCHING BIRDS</b>
<b>Tyranidae</b>	<b>Flycatchers</b>
<i>Sayornis saya</i>	Say's Phoebe
<i>Tyrannus verticalis</i>	Western Kingbird
<b>Hirundinidae</b>	<b>Swallows</b>
<i>Hirundo rustica</i>	Barn Swallow
<i>Tachycineta thalassina</i>	Violet-green Swallow
<b>Corvidae</b>	<b>Jays, Magpies, and Crows</b>
<i>Corvus corax</i>	Common Raven
<b>Paridae</b>	<b>Chicadees, Titmice</b>
<i>Auriparus flaviceps</i>	Verdin

TABLE 5.2-5  
Incidental Observations of Wildlife Species from the 2007 Desert Tortoise Protocol Surveys of the Project Area

Scientific Name	Common Name
<b>Troglotytidae</b>	<b>Wrens</b>
<i>Campylorhynchus brunneicapillus</i>	Cactus Wren
<b>Muscicapidae</b>	<b>Kinglets, gnatcatchers, thrushes</b>
<i>Polioptila caerulea</i>	Blue-gray gnatcatcher
<b>Mimidae</b>	<b>Mimic Thrashers</b>
<i>Oreoscoptes montanus</i>	Sage Thrasher
<i>Toxostoma crissale</i>	Crissal Thrasher
<i>Toxostoma lecontei</i>	LeConte's Thrasher
<b>Laniidae</b>	<b>Shrikes</b>
<i>Lanius ludovicianus</i>	Loggerhead Shrike
<b>Emberizidae</b>	<b>Emberizids</b>
<i>Amphispiza bilineata</i>	Black-throated Sparrow
<i>Icterus galbula bullockii</i>	Northern Oriole
<i>Spizella breweri</i>	Brewer's Sparrow
<i>Dendroica caerulescens</i>	Black-throated Gray Warbler
<i>Dendroica coronata</i>	Yellow-rumped warbler
<i>Dendroica townsendi</i>	Townsend's warbler
<i>Vermivora celata</i>	Orange-crowned Warbler
<i>Wilsonia pusilla</i>	Wilson's Warbler
<b>Fringillidae</b>	<b>Finches</b>
<i>Carduelis psaltria</i>	Lesser Goldfinch
<i>Carpodacus mexicanus</i>	House Finch
<b>MAMMALS</b>	
<b>ORDER: CARNIVORA</b>	<b>FLESH-EATERS</b>
<b>Mustelidae</b>	<b>Weasels, Skunks, etc.</b>
<i>Taxidea taxus</i>	American Badger
<b>Canidae</b>	<b>Dogs, wolves, and foxes</b>
<i>Canis latrans</i>	Coyote
<i>Vulpes macrotis</i>	Kit Fox
<b>ORDER: RODENTIA</b>	<b>GNAWING MAMMALS</b>
<b>Sciuridae</b>	<b>Squirrels</b>
<i>Ammospermophilus leucurus</i>	Whitetail Antelope Squirrel

TABLE 5.2-5  
Incidental Observations of Wildlife Species from the 2007 Desert Tortoise Protocol Surveys of the Project Area

Scientific Name	Common Name
<b>ORDER: LAGOMORPHA</b>	<b>PIKAS, HARES, AND RABBITS</b>
<b>Leporidae</b>	<b>Hares and Rabbits</b>
<i>Lepus californicus</i>	Black-tailed Jackrabbit
<i>Sylvilagus audubonii</i>	Audubon's Cottontail
<b>ORDER: ARTIODACTYLA</b>	<b>EVEN-TOED HOOFED MAMMALS</b>
<b>Bovidae</b>	<b>Bison, goats, muskox, and sheep</b>
<i>Bos Taurus</i>	Domestic Cow
<b>ORDER: PERISSODACTYLA</b>	<b>ODD-TOED UNGULATES</b>
<b>Equidae</b>	<b>Horse-like animals</b>
<i>Equus asinus</i>	Feral Burro
<b>REPTILES</b>	
<b>ORDER: TESTUDINES</b>	<b>TURTLES</b>
<b>Testudinidae</b>	<b>Land Tortoises</b>
<i>Gopherus agassizii</i>	Desert Tortoise
<b>ORDER: SQUAMATA</b>	<b>LIZARDS AND SNAKES</b>
<b>Iguanidae</b>	<b>Iguanids</b>
<i>Callisaurus draconoides</i>	Zebra-tailed Lizard
<i>Crotaphytus collaris</i>	Common Collared Lizard
<i>Dipsosaurus dorsalis</i>	Desert Iguana
<i>Uta stansburiana</i>	Side-blotched Lizard
<b>Teiidae</b>	<b>Whiptails</b>
<i>Cnemidophorus tigris</i>	Western Whiptail
<b>Viperidae</b>	<b>Pit Vipers</b>
<i>Crotalus cerastes</i>	Sidewinder

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
PLANTS KNOWN IN THE REGION WITH SOME, PROBABLY LOW, POTENTIAL TO OCCUR IN THE STUDY AREA											
<i>Agave utahensis</i> var. <i>nevadensis</i> Clark Mountain agave	P	-	-	-	4.2	E Mojave Desert; Clark Mtn. Range, Mescal Mtns., Ivanpah Mtns., Kingston Mtns., SBD; to NV.	JTWld, MDScr, PJWld	2,950-5,200 ft (900-1,585 m) Rocky slopes, often steep; calcareous and volcanic substrates. Occurs on limestone substrate.		May-July yellow	E edge of Clark Mtn. Range, about 2 miles WNW of Ivanpah 3 (CNDDDB 2007c). Found within project area during 2007 surveys.
<i>Aliciella triodon</i> Coyote gilia	A	-	-	-	2.2	E Mojave Desert; Clark Mtn. Range, Mid Hills, SBD; Nopah Range, INY; to NV, AZ, CO, NM, UT.	GBScr, PJWld	2,000-5,580 ft (610-1,700 m) Sometimes on sandy soils.		April-June purple	Clark Mtn. and Pinto Valley quads, within 3-30 miles of the project area (CNDDDB 2007c).
<i>Androstephium breviflorum</i> small-flowered androstephium	P	-	-	-	2.3	E Mojave Desert from about Cronese Valley to Ivanpah Valley, and E of Whipple Mts., SBD; Cadiz Valley, RIV; to AZ, NV, CO, UT.	MDScr (MCBS) , DeDns	720-5,260 ft (220-1,600 m) Dry loose sandy to rocky soil on sand dunes and alluvial fans.		Apr-May white	Ivanpah Valley at E edge of Clark Mtn. Range, about 2 miles WNW of Ivanpah 3 (CNDDDB 2007).
<i>Arctomecon merriamii</i> white bear poppy	P	-	-	-	2.2	Death Valley region to Clark Co., NV; Last Chance Range to Resting Spring Range, INY; Silurian Vally, Clark Mtn. Range, SBD.	MDScr (MCBS, MMWS, DCS), ChScr	1,600-6,800 ft (490-2,075 m) Loose rocky slopes and flats of marine deposits: gypsum, limestone, dolomite. Occurs on limestone substrate.		Apr-May white	S edge of E Clark Mtn. Range, about 1.7 miles N of Ivanpah 3 (CNDDDB 2007).
<i>Cordylanthus parviflorus</i> purple bird's-beak	A	-	-	-	2.3	E Mojave Desert; New York Mtns., Providence Mtns., Mid Hills, SBD; to AZ, NV, UT, ID.	MDScr, JTWld, PJWld	2,300-7,220 ft (700-2,200m). Sandy to rocky bajadas and arroyos.		Aug-Oct pink to lavender	Observed in Mid Hills, about 30 miles S of project area (CalFlora 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Coryphantha chlorantha</i> Desert pincushion	P	-	-	-	2.2	E Mojave Desert; Clark Mtn. Range, Mescal Range, Ivanpah Mtns., SBD; Kingston Range, SBD & INY; to NV, AZ, UT.	JTWld MDSr, PJWld	3,500-5,000 ft (1,050-1,525 m) Carbonate, gravelly, and rocky soils. Occurs on limestone substrate.		Apr-Sept straw colored or yellow to pink	Mescal Range and Clark Mtn. Range, about 2 miles N of Ivanpah 3 (CNDDDB 2007, CalFlora 2007). Found within project area during 2007 surveys.
<i>Coryphantha vivipara</i> var. <i>rosea</i> viviparous foxtail cactus	P	-	-	-	2.2	E Mojave Desert; Clark Mtn. Range, Mescal Range, New York Mtns., Mid Hills, Cima, SBD; to NV, AZ.	MDSr (BBS), JTWld, PJWld	4,000-6,000 ft (1225-1,825 m) Dry stony or gravelly slopes and ridges, in bare sandy or gravelly loam; in quartz monzonite and limestone.		May-June magenta to purplish	Clark Mtn. Range and Mescal Range, within 2-5 miles of project area (Thorne et al. 1981, CalFlora 2007, CNDDDB 2007). Found within project area during 2007 surveys.
<i>Cymopterus gilmanii</i> Gilman's cymopterus	P	-	-	-	2.3	Death Valley region and E Mojave Desert; Last Chance, Cottonwood, Grapevine, Funeral, Kingston and Clark mtns., INY, SBD; to western NV.	MDSr (MCBS, DCS)	3,300-6,500 ft (1000-1,975 m) Dry rocky or gravelly slopes, desert canyons, rock ledges or cliffs, often on carbonates. Occurs on limestone substrate.		Mar-May purplish	About 0.75 mile SE of Umberci Mine, Clark Mtn. Range, about 2 miles N of project area (CNDDDB 2007).
<i>Cynanchum utahense</i> Utah vine milkweed	P	-	-	-	4.3	Mojave Desert; 29 Palms region, Joshua Tree, Old Woman Springs, Ivanpah Mtns., SBD; Colorado Desert; Blythe, RIV; Anza-Borrego area, SDG, Ocotillo Wells, IMP; to NV, AZ, UT.	MDSr, SDSr	1,150-4,700 ft (350-1,435 m) Sandy or gravelly soils, often in washes climbing up through shrubs.		Apr-June yellow	Ivanpah Mtns., about 15 miles S of project area (Thorne et al. 1981, Jepson Online Interchange 2007). Found within project area during 2007 surveys.

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Enceliopsis nudicaulis</i> ssp. <i>nudicaulis</i> naked-stemmed daisy	P	-	-	-	4.3	Death Valley region and E Mojave Desert; Inyo, Saline, Last Chance, Panamint, and Clark Mtn. ranges, INY, SBD; to AZ, NV, UT, ID.	MDScr (BBS), GBScr, PJWld	2,875-6,400 ft (875-1,950 m) In clayey soil, or sand and gravel, on slopes, cliffs and ridges; in calcareous or gypsicolous soils. Occurs on limestone substrate.		Apr-May (Aug) gray	About 0.75 mile SE of Umberci Mine, Clark Mtn. Range, about 2 miles N of project area (CNDDDB 2007).
<i>Grusonia parishii</i> Parish club-cholla	P	-	-	-	2.3	Mojave and Colorado deserts; known in CA from 11 sites, including the New York, Ivanpah and Clark mtns, SBD, RIV, IMP; to NV, AZ, TX?.	MDScr, SDScr, JTWld	980-5,000 ft (300-1,524 m)  Sandy or sandy-gravelly soil on flats, valleys, plains, gravelly-rocky bajadas, gentle limestone slopes.		May-June (July)  red to yellow	Clark Mtn. Range, within 5 miles of the project area (Jepson Online Interchange 2007). Found within project area during 2007 surveys.
<i>Mortonia utahensis</i> Utah mortonia	P	-	-	-	4.3	Death Valley region and E Mojave Desert; Nopah, Funeral, Grapevine, Kingston, Clark Mtn. ranges, INY, SBD; to S NV.		2,500-6,900 ft (760-2,100 m) Rocky areas. Occurs on limestone substrate.		Mar-May white	About 0.75 mile SE of Umberci Mine, Clark Mtn. Range, about 2 miles N of project area (CNDDDB 2007). Found within project area during 2007 surveys.
<i>Muilla coronata</i> crowned muilla	P	-	-	-	4.2	Owens Valley and southern Sierra south to Antelope Valley and east to the Spring Range, NV; INY, KRN, LAX, SBD, TUL.	ChScr, MDScr, JTWld, PJWld	2,300-6,620 ft (700-2,010 m) Sandy or sandy-gravelly soil, or heavy soils.		Mar-Apr white with green line on outside of petals	About 24 miles SSE of the project area at 5,085 ft on the S side of the New York Mtns (Thorne et al. 1981, Jepson Online Interchange 2007).



TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Opuntia curvospina</i> (=O. chlorotica)  Curved-spine beavertail	P	-	-	-	2.2	E Mojave Desert; known in CA from 3 sites in the vicinity of the New York Mtns., SBD; to NV, AZ.	Chprl, MDScr, PJWld	3,280-4,650 ft (1,000-1,400 m) A stabilized hybrid between <i>O. phaeacantha</i> and <i>O. chlorotica</i> .		Apr-June	Nipton quad., about 20 miles E of project area (Jepson 1909).
<i>Penstemon albomarginatus</i> white-margined beardtongue	P	-	-	S	1B.2	E Mojave Desert; between Pisgah and Lavic and between Cadiz and Danby, SBD; a few widely scattered sites in NV, AZ.	MDScr (MCBS)	800-2,200 ft (250-675 m) Sandy soils along washes.		Mar-May pink to purple; lvs with white margin	About 7 miles ENE of Primm, NV, in the Ivanpah Valley, E of Roach Dry Lake (NNHP 2007).
<i>Penstemon bicolor</i> ssp. <i>roseus</i> Rosy two-toned beardtongue	P	-	-	-	2.3	E Mojave Desert; known in CA from 3 sites, Clark Mtn. Range, Castle Mtns., and Piute Spring, SBD; to NV.	JTWld MDScr	3,000-4,900 ft (700-1,500 m) Rocky or gravelly soils, sometimes in disturbed areas.		May cream to magenta; corolla gibbous, like <i>P. floridus</i>	Clark Mtn. Range, 2 miles E of Keany Pass, about 2 miles N of project area (CNDDDB 2007).
<i>Sclerocactus johnsonii</i> bee-hive cactus	P	-	-	-	2.2	Death Valley region and E Mojave Desert; Funeral, Greenwater, Resting Spring and Nopah ranges, INY; Clark Mtn. Range, SBD; to Clark Co., NV, UT, AZ;	MDScr	1,640-4,000 ft (500-1,200 m) Granitic soils of hills and alluvial fans.		Apr-May magenta to pink or greenish turning yellow	E edge of Clark Mtn. Range, about 2.4 miles NW of Ivanpah 3; only known SBD site, probably extirpated by pipeline construction (CNDDDB 2007).
<i>Sphaeralcea rusbyi</i> ssp. <i>eremicola</i> Rusby's desert mallow	P	-	-	S	1B.2	Death Valley region and E Mojave Desert; Panamint Mts., Clark Mtn. Range, other locations, SBD; Emigrant Cyn., INY.	MDScr (CBS, BBS), JTWld	2,265-4,800 ft (995-1,500 m) Desert slopes and gravelly sandy washes, often in carbonate. Occurs on limestone substrate.		May-June red- orange	Clark Mtn. Range at Ivanpah Springs and 0.25 mile NNW of Umberci Mine, about 2 miles N of project area (CNDDDB 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
PLANTS KNOWN IN THE REGION, BUT WITH VERY LOW POTENTIAL TO OCCUR IN THE STUDY AREA											
<i>Achnatherum aridum</i> Mormon needle grass	P	-	-	-	2.3	Death Valley region and E Mojave Desert; Last Chance, Cottonwood, Funeral, Kingston, and Clark Mtn. ranges eastward; INY, SBD; to AZ, NV, TX.	MDScr (BBS, DCS), GBSScr, PJWld	3,700-7,400 ft (1,125-2,250 m)  Dry limestone on slopes, ridges and rock outcrops. Occurs on limestone substrate.		May-June	Clark Mtn. Range, within 5 miles of project area (CNDDDB 2007).
<i>Astragalus cimae</i> var. <i>cimae</i> Cima milk-vetch	P	-	-	-	1B.2	E Mojave Desert; from mountains east of Cima; New York, Ivanpah, Clark, Mescal and Marl mtns., Mid Hills, SBD; to NV.	GBScr, JTWld, PJWld	2,900-6,000 ft (875-1,825 m) Calcareous soils, mesas and stony hillsides; also in granite sand. Occurs on limestone substrate.		Apr-May	Clark Mtn. Range, within 5 miles of project area (CNDDDB 2007).
<i>Astragalus nutans</i> Providence Mountain milk-vetch	P	-	-	-	4.2	E Mojave Desert in Clark, New York, Providence, Granite and Old Dad mtns.; N Colorado Desert; IMP, RIV, SBD.	MDScr (MCBS), JTWld, PJWld, SDSScr	1,500-6,500 ft (450-1,975 m) Sandy to rocky washes, canyon bottoms and foothill slopes. Thorne, Prigge and Henrickson (1981) report it from 1250-1925 m in the E Mojave Desert.		Mar-June (Oct)	Clark Mtn. Range, within 5 miles of project area (Jepson Online Interchange 2007).
<i>Astrolepis cochisensis</i> ssp. <i>cochisensis</i> scaly cloak fern	P	-	-	-	2.3	E Mojave Desert; Providence, Clark, Ivanpah, and Mescal mtns., SBD; to AZ, northern Mexico.	JTWld, PJWld	3,200-5,500 ft (975-1,675 m) Dry limestone slopes and crevices. on carbonate soils. 900-1,800 m Occurs on limestone substrate.		Apr-Oct	Clark, Ivanpah, and Mescal Mtns. 5-30 miles from project area (CNDDDB 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Bouteloua eriopoda</i> black grama grass	P	-	-	-	4.2	E Mojave Desert in CA, eastward through NV and AZ, to west TX and west OK, northern Mexico.	MDScr (MCBS), JTWld, PJWld	2,950-6,250 ft (900-1,900m) Sandy or gravelly washes, clayey flats, and rocky slopes. Thorne, Prigge and Henrickson (1981) report it from 1,220-1,830 m in the Eastern Mojave.		May-Aug (Oct)	Clark Mtn. Range, within 5 miles of project area (Thorne et al. 1981, Jepson Online Interchange 2007).
<i>Bouteloua trifida</i> red grama grass	P	-	-	-	2.3	Death Valley region and E Mojave Desert; Furnace Creek area, Kingston Range, Clark, New York and Providence mtns., INY, SBD; common from TX and northern Mexico to NM, AZ, UT and NV.	MDScr, PJWld	975-6,400 ft (300-1,950m) In CA, on rocky limestone slopes and ravines. Thorne, Prigge and Henrickson (1981) report it from 1,220-1,950 m in the Eastern Mojave. Occurs on limestone substrate.		May-June (Sept)	Clark Mtn. Range, within 5 miles of project area (Thorne et al. 1981, Jepson Online Interchange 2007).
<i>Calochortus striatus</i> alkali mariposa lily	P	-	-	S	1B.2	Southern Sierra Nevada near Weldon, KRN; Mojave Desert, Red Rock Cyn., Antelope Valley KRN, LAX; to N base San Gabriel and San Bernardino mtns., SBD; also TUL; and E to Ash Meadows and Las Vegas NV.	Chprl, ChScr, MDScr, Medws seeps	230-5,230 ft (70-1,595 m) Alkaline meadows and springy places; low winter-wet subalkaline places in desert chenopod scrub.		Apr-Jun lavender with purple veins	Ash Meadows, Las Vegas, NV, > 40 miles N and NE of project area.
<i>Cryptantha holoptera</i> winged cryptantha	A (P)	-	-	-	4.3	Very scattered in the Colorado and eastern Mojave deserts of CA; IMP, INY, RIV, SBD, SDG, to western AZ.	SDScr, MDScr (MCBS)	400-2,600 ft (125-800 m) Moist washes and gravelly or rocky slopes and ridges.		Mar-Apr white	About 70 miles SW of project area near Pisgah Crater (Jepson Online Interchange 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
*** <i>Eriogonum bifurcatum</i> forked buckwheat	A	-	-	S	1B.2	E Mojave Desert, Pahrump, Mesquite and Stewart valleys, eastern INY to Nye Co., NV.	ChScr, MDSr (MCBS)	2,500-2,600 ft (750-800 m) In sand; sandy loam near sand dunes.		May-June	Known from Mesquite Valley, E San Bernardino County, about 20 miles NE of project area (Jepson Online Interchange 2007).
<i>Juncus nodosus</i> knotted rush	P	-	-	-	2.3	Southern Sierra Nevada, White-Inyo Range, northern desert mts., Clark Mtns.; INY, SBD, STA, TUL; scattered across US, southern Canada.	Mesic Medws, seeps, MshSw	100-6,500 ft (30-1,980 m) Streambanks, lake shores, wet meadows, and seeps.		July-Sept	Clark Mtn. Range, Colosseum Gorge, within 5 miles W of project area (CNDDDB 2007).
<i>Matelea parvifolia</i> spearleaf	P	-	-	-	2.3	Mojave Desert near Kelso and several locations in the Colorado Desert; RIV, SBD, SDG; to TX.	MDSr, SDSr	In CA, 1,450-3,600 ft (440-1095 m) Dry rocky ledges and slopes.		Mar-May	About 35 miles SSW of project area near Kelso (CNDDDB 2007).
<i>Opuntia basilaris</i> var. <i>brachyclada</i> short-joint beavertail	P	-	-	S	1B.2	Desert slopes of San Gabriel and San Bernardino mts. and in the Providence Mts.; LAX, SBD.	Chprl, MDSr, JTWld, PjWld	1,400-5,900 ft (425-1800 m) Sandy soils.		Apr-June	About 40 miles S of project area at about 3000 ft in the Providence Mtns. (CNDDDB 2007).
<i>Penstemon calcareus</i> limestone beardtongue	P	-	-	-	1B.3	Death Valley region and E. Mojave Desert; Last Chance, Cottonwood, Panamint, Grapevine, and Providence mtns.; INY, SBD; to NV.	DCS in MDSr, JTWld, PjWld	3,500-7,800 ft (1060-2375m) Gravelly slopes and dry crevices in limestone; dry canyon sides. Occurs on limestone substrate.		Apr-May light rose to rose- purple	About 40 miles S of project area in the Providence Mtns. (CNDDDB 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Penstemon fruticiformis</i> var. <i>amargosae</i> Death Valley beardtongue	P	-	-	S	1B.3	Death Valley region, Funeral, Argus, Avawatz, Grapevine Mtns., INY; Kingston Range, INY, SBD; to NV.	MDScr	2,800-5,335 ft (850-1,400 m) Rocky scree slopes and sandy or gravelly washes and drainages.		Apr-June	Kingston Range, about 35 miles NW of the project area (CNDDDB 2007).
<i>Penstemon stephensii</i> Stephen's beardtongue	P	-	-	S	1B.3	E Mojave Desert, Nopah, Kingston, Providence, Old Dad, and Granite mtns., Mid Hills, INY, SBD.	MDScr, GBScr, PJWld	3,700-6,100 ft (1,125- 1,850m) Gravelly to rocky slopes, crevices or cliffs; granite, limestone or dolomite. Occurs on limestone substrate.		Apr-Jun	Kingston Range, about 35 miles NW of project area, and Mid Hills, about 30 miles S of the project area (CNDDDB 2007).
<i>Penstemon utahensis</i> Utah beardtongue	P	-	-	-	2.3	E Mojave Desert, New York, Providence, Kingston and Clark Mtn. ranges, INY, SBD; to AZ, UT.	ChScr, GBScr, MDScr, PJWld	3,500-8,200 ft (1,065-2,500 m) Gravelly to rocky soils on slopes. Thorne, Prigge and Henrickson (1981) report it from 1,220-1,740 m in the Eastern Mojave.		Apr-May	Near Colosseum Mine, Clark Mtn. Range, about 5 miles W of the project area (CNDDDB 2007).
*** <i>Phacelia parishii</i> Parish's phacelia	A	-	-	S	1B.1	Mojave Desert, near Lucerne, Calico, and Coyote dry lakes, SBD; southern NV.	playas, MDScr (MCBS)	1,775-6,000 ft (550-1,825 m) Alkaline playas and in NV also on barren alkali knolls in MDScr and JTWld.		Apr-Jul lavender with yellow tube	Coyote Dry Lake at Fort Irwin National Training Center, about 70 miles W of the project area (CNDDDB 2007).
<i>Piptatherum micranthum</i> little-seed ricegrass	P	-	-	-	2.3	E Mojave Desert, Kingston and Clark mtn. ranges, SBD; White Mtns., INY, MNO: to Saskatchewan, North Dakota and NM.	UCFrS, DCS, PJWld	3,000-10,300 ft (900-3,150 m) Rocky crevices, gravelly carbonate or granitic slopes and canyon bottoms. Occurs on limestone substrate.		Jun-Sept	Curtis Canyon, 1.3 miles NE of Clark Mtn. summit, and about 7 miles W of project area (CNDDDB 2007).

TABLE 5.2-6  
Special-Status Plants with Potential to Occur Onsite

Scientific/ Common Name	Ann/ Per <sup>1</sup>	Rank or Status <sup>2</sup>				Distribution <sup>3</sup>	Habitat Types <sup>4</sup>	Elevational Range and Habitat Preferences	Habitat Present, Site/Habitat Quality	Flowering Period/ Color	Known Locations Nearest To Project Area
		FWS	DF G	BL M	CNP S						
<i>Selaginella leucobryoides</i> Mojave spike-moss	P	-	-	-	4.3	Sierra Nevada, Mojave Desert, Panamint, Inyo mnts., INY; Providence Mtns., Kingston Range, SBD; Spring Mtns., NV.	MDScr, PJWld	2,000-7,500 ft (600-2,275 m) Dolomite and limestone crevices and in shade among boulders. Occurs on limestone substrate.		No flowers (spore- bearing)	Spring Mtns, Kingston Range, within 35 miles of project area (Jepson Online Interchange 2007).

Notes:

<sup>1</sup> Annual/Perennial

<sup>2</sup> Rank or status abbreviations:

1996 FWS (U.S. Fish and Wildlife Service) listings under the Endangered Species Act (USFWS 1996a, 1996b); these are the most recent lists of candidate species: PE - proposed endangered.

DFG (California Department of Fish and Game) listings are: E - endangered, R - rare under the California Native Plant Protection Act and California Endangered Species Act; CP - species is identified under provisions requiring a permit in order to harvest for horticultural purposes under the California Desert Plant Protection Act.

CNDDDB (California Natural Diversity Data Base, a section within DFG) ranks are: S1- extremely endangered; S2- endangered; S3- restricted range, rare; S4- apparently secure; S5- demonstrably secure. A more precise degree of threat is sometimes expressed by a decimal followed by a number. The possible range of values is 1-3 with 1 signifying the most threatened and 3 the least threatened. Example: A species ranked S2.1 is endangered and extremely threatened in California.

CNPS (California Native Plant Society) ranks are: 1A - plant presumed extinct in California; 1B - plants rare and endangered in California and elsewhere; 2 - plants rare, threatened, or endangered in California, but more common elsewhere; 3 - plants about which we need more information - a review list; and 4 - plants of limited distribution - a watch list. California Native Plant Society Threat Extensions: .1 = Seriously endangered in California..2 = Fairly endangered in California..3 = Not very endangered in California. ? = Represents uncertainty regarding the rank threat.

<sup>3</sup> Abbreviations used under distribution are: AZ=Arizona; CA=California; CO=Colorado; FRE=Fresno Co., CA; ID= Idaho; IMP=Imperial Co., CA; INY=Inyo Co., CA; KNG=Kings Co., CA; KRN=Kern Co., CA; LAS=Lassen Co., CA; LAX=Los Angeles Co., CA; MER=Merced Co., CA; MNO=Mono Co., CA; MOD - Modoc Co., CA; NM=New Mexico; NV=Nevada; OK=Oklahoma; OR=Oregon, PLU=Plumas Co., CA; RIV=Riverside Co., CA; SBD=San Bernardino Co., CA; SDG - San Diego Co., CA; SIS - Siskiyou Co., CA; SO=Sonora, Mexico; TUL=Tulare Co., CA; TX=Texas; UT=Utah; WA=Washinton; and WY=Wyoming.

<sup>4</sup> Habitat types reported for taxa in California. Designations largely follow the nomenclature developed by the California Natural Diversity Data Base (Holland, 1986) and abbreviations used in Smith and Berg (1988). They include: BBS - blackbush scrub; BUFRs - broadleaf upland forests; Chprl - chaparral; ChScr - chenopod scrub; CmWld - cismontane woodland; DeDns - desert dunes; GBScr - Great Basin scrub; JTWld - Joshua tree woodland; MDScr - Mojavean Desert scrub (of which MCBS, Mojave creosote bush scrub, MMWS, Mojave mixed woody scrub, and DCS, desert calcicolous scrub are elements); Medws - meadows; MshSw - marshes and swamps; PJWld - pinyon-juniper woodland; RpFRs - riparian forest; SCFRs - subalpine conifer forest; SDSCr - Sonoran desert scrub; UCFrs - upper montane coniferous forest and VFGrs - valley and foothill grasslands.

TABLE 5.2-7  
Special-Status Wildlife Species Occurring or Potentially Occurring in Project Area

Common Name	Scientific Name <sup>a</sup>	Status <sup>b</sup>	Season <sup>c</sup>	Primary Habitat <sup>d</sup>	Potential Occurrence in Project Area	Comments
<b>Reptiles</b>						
Desert Tortoise	<i>Gopherus agassizii</i>	FT, CT	RES	Common in desert scrub, desert wash, and Joshua tree habitats. Requires friable soils for burrow and nest construction. Also requires creosote bush habitat with large annual wildflower blooms for foraging.	Observed and recorded in project area during the 2007 biological surveys. High potential for foraging and breeding.	
<b>Birds</b>						
Western burrowing owl	<i>Athene cunicularia hypugaea</i>	FSC, CSC, MB	RES	Habitats includes open grassland habitat with fossorial mammal burrows, often associated with ground squirrels.	Low to moderate habitat for burrowing owl.	Use small mammal burrows for cover and natal dens. Breeding season is typically from February through August.
Loggerhead shrike	<i>Lanius ludovicianus</i>	FSC, CSC, MB	RES	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats. with adequate hunting perches.	Observed in project area during 2007 surveys. High potential for foraging and nesting in the project area.	Largely nonmigratory and has been known to defend year-round territories. Nests are typically well concealed and built in dense shrubs or trees. In California the breeding period typically begins in March and may extend into August.
Golden eagle	<i>Aquila chrysaetos</i>	FSC, CSC, FP, BLM SS	RES	Open country, rolling foothills, mountain areas and desert; breeds on overhanging ledges, high cliff sites, and large trees.	Observed in project area during 2007 surveys. High potential for foraging and moderate nesting in the project area.	
LeConte's thrasher	<i>Toxostoma lecontei</i>	FSC, CSC	RES	Desert resident; primarily of open desert wash, desert scrub, alkali desert scrub, and desert succulent scrub habitats.	Observed in project area during 2007 surveys. Moderate potential for foraging and nesting in the project area.	
Hepatic tanager	<i>Piranga flava</i>	CSC, MB	RES, SUMR	(Nesting) White fir-pinyon forest on desert peaks, 5300-8100 ft. elevation, under-story of xerophytic shrubs.	Low potential. No nesting or foraging habitat in project vicinity, though CNDDDB record exists for species to the west in Clark Mountains. May migrate through area.	

TABLE 5.2-7  
Special-Status Wildlife Species Occurring or Potentially Occurring in Project Area

Common Name	Scientific Name <sup>a</sup>	Status <sup>b</sup>	Season <sup>c</sup>	Primary Habitat <sup>d</sup>	Potential Occurrence in Project Area	Comments
Summer tanager	<i>Piranga rubra</i>	CSC, MB	RES, SUMR	(Nesting) Uncommon summer resident and breeder in desert riparian habitat along lower Colorado River, also occurring very locally elsewhere in southern California deserts.	Low potential. No nesting or foraging habitat in or adjacent to project area, though CNDDDB record exists for species to the west in Clark Mountains. May migrate through area.	Requires cottonwood-willow riparian for nesting and foraging; prefers older, dense stands along streams.
Bendire's thrasher	<i>Toxostoma bendirei</i>	BCC, CSC, BLM SS, MB	RES, SUMR	Local spring/summer resident in flat areas of desert succulent shrub/Joshua tree habitats in Mojave Desert.	Moderate potential. Nesting and foraging habitat potentially exist in vicinity of project area. CNDDDB record exists for species to west and southwest. May migrate through area.	Nests in cholla, yucca, palo verde, thorny shrub, or small tree, usually 0.5 to 20 feet aboveground.
Gray-headed junco	<i>Junco hyemalis caniceps</i>	CSC, MB	RES, SUMR	(Nesting) Summer resident breeding locally in Clark Mountains and Grapevine Mountains.	Low potential. No nesting or foraging habitat in or adjacent to project area, though CNDDDB record exists for species to the west in Clark Mountains. May migrate through area.	Inhabits White fir association at 7300 feet on Clark Mountain.
Virginia's warbler	<i>Vermivora virginiae</i>	BCC, CSC, MB	RES, SUMR	(Nesting) East slope of Sierra Nevada in arid, shrubby, mixed conifer, pinyon-juniper, montane-chaparral at 7000-9000 ft.	Low potential. No nesting or foraging habitat in or adjacent to project area, though CNDDDB record exists for species to the west in Clark Mountains. May migrate through area.	Nests on arid slopes with stands of tall shrubs/scattered trees; also, riparian thickets of willow/wild rose along streams.
Gray vireo	<i>Vireo vicinior</i>	BCC, CSC, BLM SS, MB	RES, SUMR	(Nesting) Uncommon, local, summer resident in arid pinyon-juniper and chamise-redshank chaparral habitats from 2000-6500 ft. in mountains of eastern Mojave Desert.	Low potential. No nesting or foraging habitat in or adjacent to project area, though CNDDDB record exists for species to the west in Clark Mountains. May migrate through area.	Forages and nests in areas formed by a continuous growth of twigs, 1-5 feet aboveground.
Vaux's swift	<i>Chaetura vauxi</i>	CSC, MB	RES	Breeds from southeastern Alaska and Montana to central California. Foraging habitat is open sky over woodlands, lakes, and rivers, where flying insects are abundant.	Observed in project area during May 2007 surveys. Low potential for foraging in the project area. Not expected to nest in vicinity of project area. No CNDDDB record exists for this species in project vicinity.	Nesting habitat consists of forest, either mixed or coniferous, but primarily old growth with snags for nesting and roosting.



TABLE 5.2-7  
Special-Status Wildlife Species Occurring or Potentially Occurring in Project Area

Common Name	Scientific Name <sup>a</sup>	Status <sup>b</sup>	Season <sup>c</sup>	Primary Habitat <sup>d</sup>	Potential Occurrence in Project Area	Comments
Brewer's sparrow	<i>Spizella breweri</i>	BCC, MB	RES, SUMR	Common summer resident and breeder east of the Cascade-Sierra Nevada crest in mountains and higher valleys of the Mojave Desert. Often finds cover in sagebrush in extensive stands with moderate canopy unbroken by trees.	Observed in project area during May 2007 surveys. High potential for foraging and nesting in the project area. No CNDDDB record exists for this species in project vicinity.	Breeds in treeless shrub habitats with moderate canopy, especially in sagebrush. In winter, is common in open desert scrub and cropland habitats of southern Mojave and Colorado deserts, usually in areas with some herbaceous under-story.
Crissal thrasher	<i>Toxostoma crissale</i>	BCC, CSC	RES	Non-migratory resident ranging from southern Nevada and southeastern California to western Texas and central Mexico. Prefers habitats characterized by dense, low scrubby vegetation, such as desert and foothill scrub and riparian brush.	Observed in project area during May 2007 rare plant surveys. Moderate potential for foraging and nesting in the project area. No CNDDDB record exists for this species in project vicinity.	Nest typically consists of an open cup of twigs, lined with finer vegetation, placed in the middle of a dense shrub or bush.
<b>Mammals</b>						
Nelson's Bighorn Sheep	<i>Ovis canadensis nelsoni</i>	FSS, BLM SS	RES	Open, rocky, steep areas used for escape cover with available water and herbaceous vegetation for forage.	Unlikely to occur on the project since escape cover and foraging habitat for this species to occur do not exist.	
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	BLM SS, CSC	RES	Uncommon. Found throughout California, in all but sub-alpine and alpine habitats. May be found at any season throughout its range. Most abundant in mesic habitats.	Low potential. Forage habitat potentially exists in and adjacent to project area, though no roosting sites exist in project area. CNDDDB record exists for species to the west in Clark Mountains, where roosting sites potentially exist.	Requires caves, mines, tunnels, buildings, or other human-made structures for roosting. Extremely sensitive to disturbance of roosting sites.
American badger	<i>Taxidea taxus</i>	CSC	RES	Uncommon, permanent resident found throughout most of California. Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Badgers are generally associated with treeless regions, prairies, parklands, and cold desert areas.	Observed in project area during May 2007 surveys. High potential for foraging and denning in the project area.	Somewhat tolerant of human activities.

TABLE 5.2-7  
Special-Status Wildlife Species Occurring or Potentially Occurring in Project Area

Common Name	Scientific Name <sup>a</sup>	Status <sup>b</sup>	Season <sup>c</sup>	Primary Habitat <sup>d</sup>	Potential Occurrence in Project Area	Comments
-------------	------------------------------	---------------------	---------------------	------------------------------	--------------------------------------	----------

Notes:

<sup>a</sup> Scientific names are based on the following sources: AOU (1983); Jennings (1983); Zeiner *et al.* (1990a-c).

<sup>b</sup> Status. Status of species relative to the Federal and California State Endangered Species Acts and Fish and Game Code:

Federal Status

FE Federally listed as endangered.

FT Federally listed as threatened.

FPE Proposed endangered.

FPT Proposed threatened.

Candidate for listing as federally endangered or threatened. Proposed rules have not yet been issued because they have been precluded at present by other listing activity.

FD Delisted from Federal threatened or endangered status.

FSC Federal Species of Special Concern. Proposed rules have not yet been issued because they have been precluded at present by other listing activity.

MB Migratory Bird Treaty Act. of 1918. Protects native birds, eggs, and their nests.

BCC U.S. Fish and Wildlife Service Bird of Conservation Concern.

FSS USDA Forest Service Sensitive Species.

BLM SS BLM Sensitive Species.

California Status

CE State listed as endangered. Species whose continued existence in California is jeopardized.

CT State listed as threatened. Species that although not presently threatened in California with extinction are likely to become endangered in the foreseeable future.

CSC California Department of Fish and Game "Species of Special Concern." Species with declining populations in California.

FP Fully protected against take pursuant to the Fish and Game Code Sections 3503.5, 3511, 4700, 5050, 5515.

Other Status

CNPS California Native Plant Society Listing (does not apply to wildlife species).

Plants, rare, threatened or endangered in California and elsewhere and are rare throughout their range. According to CNPS, all of the plants constituting List 1B meet the definitions of Sec. 1901, Chapter 10 (Native Plant Protection) of the California Department of Fish and Game Code and are eligible for state listing.

<sup>c</sup> Season. Blooming period for plants. Season of use for animals. RES = Resident; SUMR = Summer; WNTR = Winter.

<sup>d</sup> Primary Habitat. Most likely habitat association.

SOURCE: California Dept. of Fish and Game, California Natural Diversity Database, July 2002; California Native Plant Society, Inventory of Rare and Endangered Vascular Plants of California, 2001.

TABLE 5.2-8  
Dates Special-Status Plant Surveys Were Conducted

Date	Total Staff per day	AMH	AEH	AE	BG	CG	DR	EK	ES	GB	JB	JD	KB	MB	MH	MR	MK	MM	RH	RS	SB	SC	TA	VL
3/28/07	2		x											x										
3/29/07	2		x											x										
3/30/07	1													x										
4/16/07	5	x	x								x		x	x										
4/17/07	5	x	x								x		x	x										
4/18/07	4	x									x		x	x										
4/19/07	4	x									x		x	x										
4/20/07	5	x									x		x	x									x	
4/21/07	3	x												x									x	
4/22/07	3	x												x									x	
4/25/07	5				x				x				x	x			x							
4/26/07	5				x				x				x	x			x							
4/27/07	5								x				x	x			x		x					
4/28/07	4								x					x			x		x					
4/29/07	4								x					x			x		x					
4/30/07	10	x			x							x	x	x		x	x	x		x	x			
5/1/07	10	x			x							x	x	x		x	x	x		x	x			
5/2/07	10	x			x							x	x	x		x	x	x		x	x			
5/3/07	11	x			x							x	x	x		x	x	x	x	x	x			
5/4/07	9	x										x		x		x	x	x	x	x	x			

TABLE 5.2-8  
Dates Special-Status Plant Surveys Were Conducted

Date	Total Staff per day	AMH	AEH	AE	BG	CG	DR	EK	ES	GB	JB	JD	KB	MB	MH	MR	MK	MM	RH	RS	SB	SC	TA	VL
5/23/07	8	x								x				X	x	x			x				x	x
5/24/07	9	x		x						x				X	x	x			x				x	x
5/25/07	4			x										X		x			x					
5/29/07	4					x						x						x	x					
5/30/07	4					x						x		X				x						
5/31/07	5					x						x		X				x	x					
6/1/07	6			x		x						x		X				x	x					
6/2/07	4			x		x								X				x						
6/4/07	12	x		x		x	x	x	x					X				x	x		x		x	x
6/5/07	12	x		x		x	x	x	x					X				x	x		x		x	x
6/6/07	12	x				x	x	x	x					X				x	x	x	x		x	x
6/7/07	12	x				x	x	x	x					X				x	x	x	x		x	x
6/8/07	11	x				x	x	x	x					X				x	x	x	x		x	
6/9/07	6					x	x		x					X				x			x			
6/10/07	1													X										

## Staff

AE	Ava Edens	GB	Gaea Bailey	MR	Matthew Ramsey
AMH	Ann M. Howald	JB	Jason Brooks	RH	Robert Hernandez
AEH	Amy E. Hiss	JD	Jeff Davis	RS	Randy Sisk
BG	Brian Gale	KB	Kerry Byrne	SB	Sandy Baron
CG	Chris Green	MB	Mark Bagley	SC	Sophia Chiang
DR	Darina Roediger	MH	Michael Haskell	TA	Tim Armstrong
EK	Ed Kentner	MK	Morgan King	VL	Victor Leighton III
ES	Eliza Shepard	MM	Marc Meyer		

TABLE 5.2-9  
Barrel Cactus Observed Within the Ivanpah SEGS

<b>California barrel cactus (<i>Ferocactus cylindraceus</i> var. <i>lecontei</i>)</b>		
<b>Location Observed</b>	<b>Number of Localities</b>	<b>Number of Individuals</b>
Ivanpah 1	40	74
Ivanpah 2	279	389
Ivanpah 3	906	1,615
Administration and Storage, Substation, Road Segments, Transmission line, and associated buffers	69	128
<b>Total California barrel cactus</b>	<b>1,294</b>	<b>2,206</b>
<b>Clustered barrel cactus (<i>Echinocactus polycephalus</i>)</b>		
<b>Location Observed</b>	<b>Number of Localities</b>	<b>Number of Individuals</b>
Ivanpah 1	516	706
Ivanpah 2	127	156
Ivanpah 3	901	1353
Administration and Storage, Substation, Road Segments, Transmission line, and associated buffers	130	215
<b>Total Clustered barrel cactus</b>	<b>1,674</b>	<b>2,430</b>
<b>TOTAL BARREL CACTUS</b>	<b>2,968</b>	<b>4,636</b>

TABLE 5.2-10  
Rare Plants Observed During 2007 Surveys

Location Observed	Number of Localities	Number of Individuals
<b>Desert pincushion (<i>Coryphantha chlorantha</i>)</b>		
Ivanpah 1 (including 250 ft buffer)	20	20
Ivanpah 2 (including 250 ft buffer)	16	16
Ivanpah 3 (including 250 ft buffer)	72	79
Northern Gas Line (including 100 ft buffer)	6	7
<b>Total Desert pincushion (<i>Coryphantha chlorantha</i>)</b>	<b>114</b>	<b>122</b>
<b>Utah vine milkweed (<i>Cynanchum utahense</i>)</b>		
Ivanpah 1	3	3
<b>Beardtongue (<i>Penstemon</i> sp.)</b>		
Ivanpah 3	5	12
<b>Parish club-cholla (<i>Grusonia parishii</i>)</b>		
Ivanpah 1 (including 250 ft buffer)	69	91
Ivanpah 3	16	39
Administration and Storage, Substation, Road Segments, Transmission line, and associated buffers	11	13
<b>Total Parish club-cholla (<i>Grusonia parishii</i>)</b>	<b>96</b>	<b>143</b>

Note: 2007 surveys targeted perennial plants only due to extremely low rainfall conditions.

TABLE 5.2-11  
Summary of Ephemeral Washes Identified in the Project Study Area

	Number of Washes	Total Length (ft)
<b>Type 1 Washes (<math>\geq</math> 10 feet wide)</b>		
Ivanpah 1	7	6,195
Ivanpah 2	27	28,859
Ivanpah 3	41	58,228
Natural Gas Pipeline Corridor*	7	8,349
Colosseum Road*	2	858
Substation	0	0
Facilities and Storage Building	3	1,857
<b>Total All Sites</b>	<b>87</b>	<b>104,346</b>
<b>Type 2 Washes (5-10 feet wide)</b>		
Ivanpah 1	77	100,006
Ivanpah 2	134	101,538
Ivanpah 3	140	137,820
Natural Gas Pipeline Corridor*	4	3,332
Colosseum Road*	5	3,400
Substation	5	1,766
Facilities and Storage Building	0	0
<b>Total All Sites</b>	<b>365</b>	<b>347,862</b>
<b>Type 3 Washes (1-4 feet wide)</b>		
Ivanpah 1	398	248,750
Ivanpah 2	342	233,012
Ivanpah 3	395	368,551
Natural Gas Pipeline Corridor*	23	24,895
Colosseum Road*	25	8,975
Substation	44	18,013
Facilities and Storage Building	10	4,537
<b>Total All Sites</b>	<b>1,237</b>	<b>906,733</b>

Note:

\* Survey area included 1,000 foot buffer around these project features.

No wetlands were observed anywhere within the entire project area, including within the one-mile buffer.

TABLE 5.2-12  
Desert Tortoise Sign by Survey Area

Area	Tortoise	Carcass	Burrow	Other Sign	Total Sign by Area
North gas line corridor	2	2	13	2	19
Ivanpah 1	10	25	65	12	112
Ivanpah 2	3	16	41	2	62
Ivanpah 3	5	19	45	4	73
Protocol ZOI transects	1	14	17	5	37
1 mile ZOI transect	1	1	3	0	5
<b>Total Sign</b>	<b>22</b>	<b>77</b>	<b>184</b>	<b>25</b>	<b>308</b>

ZOI = Zone of Influence



TABLE 5.2-13  
Summary of Permanent Impacts to Ephemeral Washes

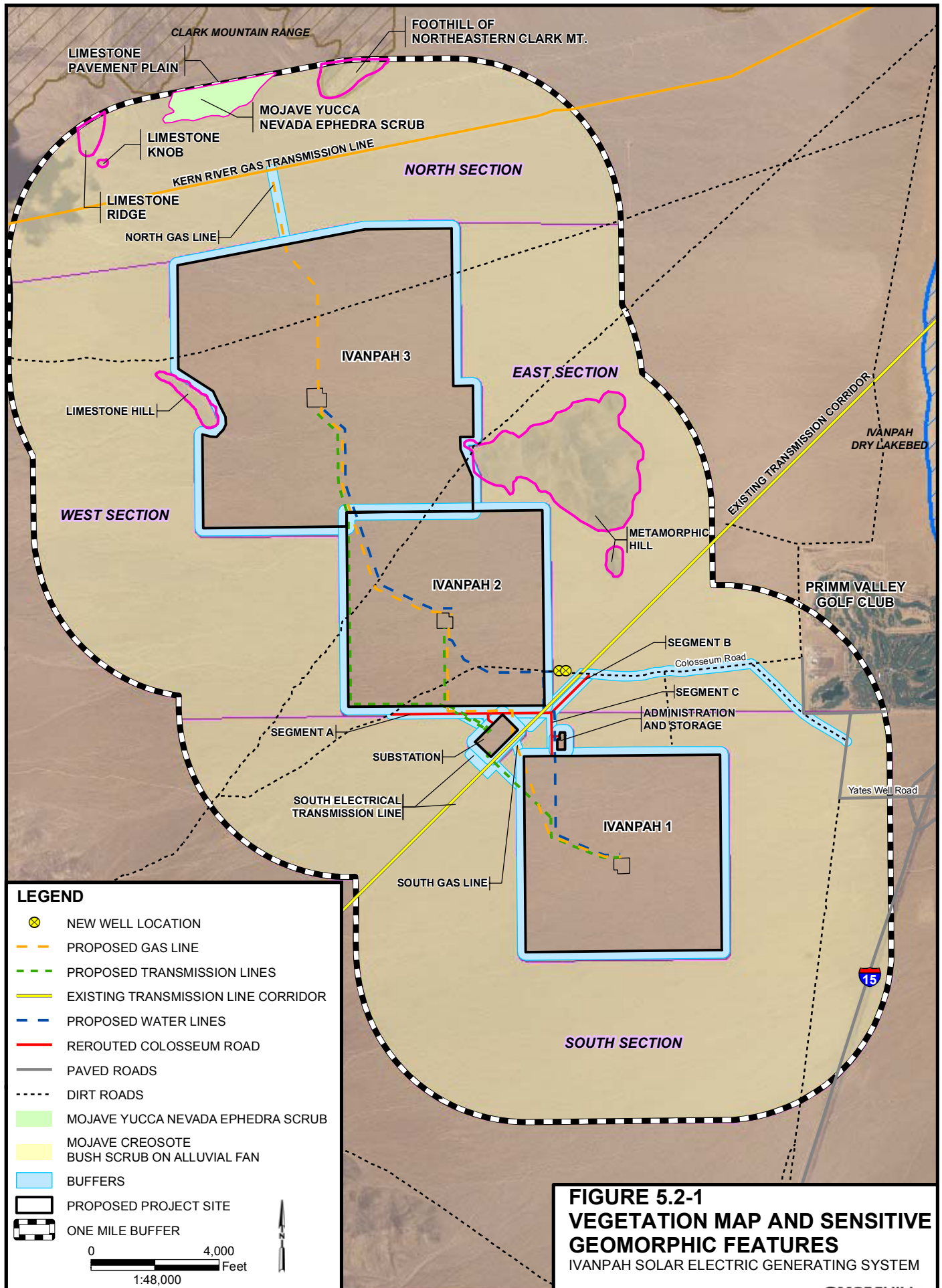
	Number of Washes	Total Length (ft)
<b>Type 1 Washes (<math>\geq 10</math> feet wide)</b>		
Power Block Ivanpah 1	0	0
Power Block Ivanpah 2	0	0
Power Block Ivanpah 3	0	0
Substation	0	0
Facilities and Storage Building	3	624
<b>Total All Sites</b>	<b>3</b>	<b>624</b>
<b>Type 2 Washes (5-10 feet wide)</b>		
Ivanpah 1	2	896
Ivanpah 2	2	234
Ivanpah 3	1	200
Substation	2	901
Facilities and Storage Building	0	0
<b>Total All Sites</b>	<b>7</b>	<b>2,231</b>
<b>Type 3 Washes (1-4 feet wide)</b>		
Ivanpah 1	9	2,221
Ivanpah 2	3	1,111
Ivanpah 3	5	2,626
Substation	17	6,375
Facilities and Storage Building	5	791
<b>Total All Sites</b>	<b>39</b>	<b>13,124</b>

TABLE 5.2-14  
Agency Contacts for Biological Resources

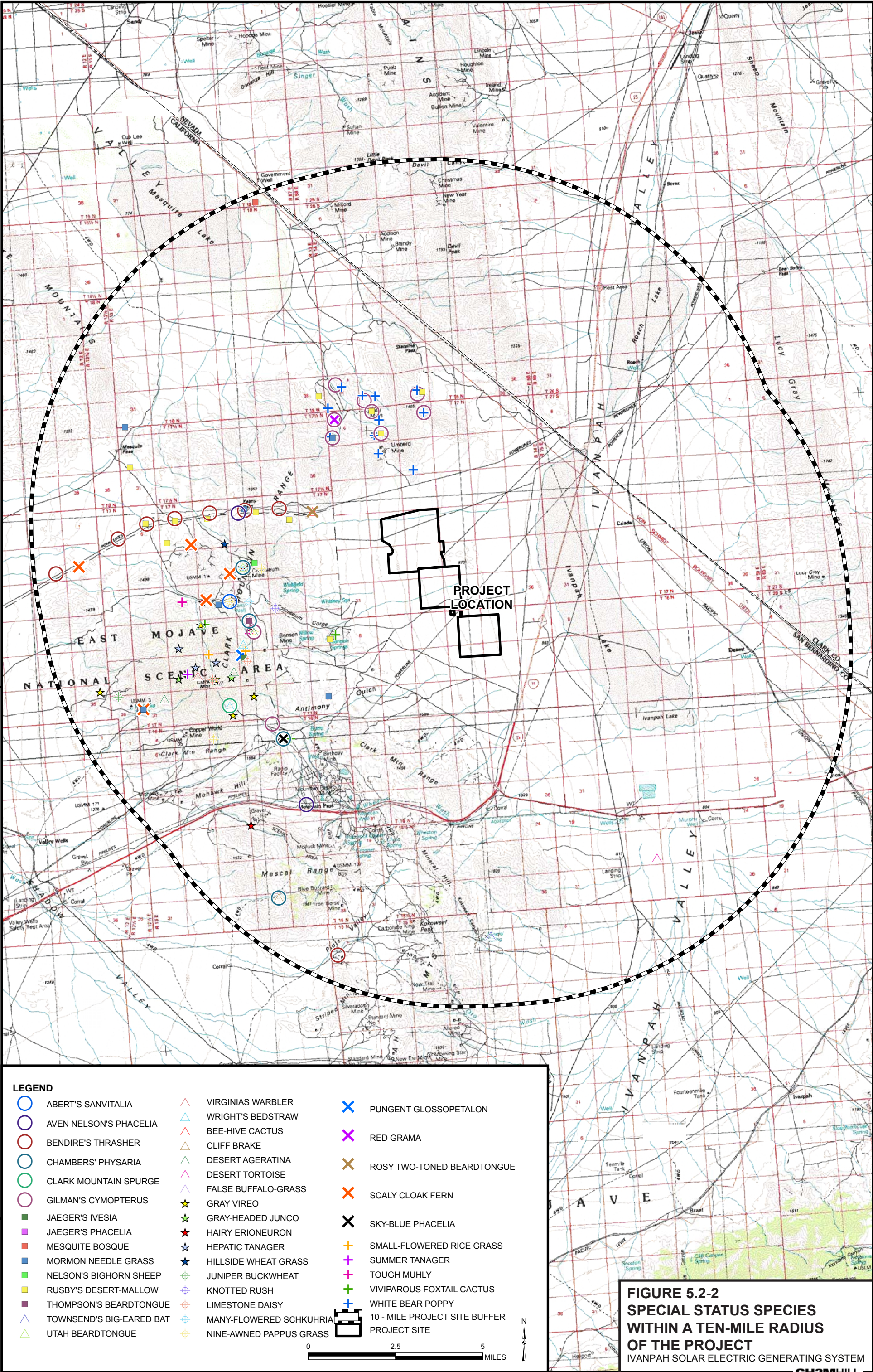
Issue	Agency	Contact
Federal threatened and endangered species - Section 7 consultation; biological surveys	U.S. Fish and Wildlife Service	Mr. Ray Bransfield, Biologist 2493 Portola Road Suite B Ventura, CA 93003 805-644-1766 Ext. 317 ray_bransfield@fws.gov
Federal threatened and endangered species - Section 7 consultation; biological surveys	U.S. Bureau of Land Management	Mr. Charles Sullivan, Biologist 1303 S. Highway 95 Needles, CA 92363 760-326-7000 clsulliv@ca.blm.gov
California threatened and endangered species - CDFG 2081; Streambed Alteration Agreement - CDFG 1600; biological surveys	California Department of Fish and Game	Ms. Rebecca Jones, Biologist 36431 41st Street East Palmdale, CA 93552 661-285-5867 dfgpalm@adelphia.net
CWA 404 Permit; wetland delineations	U.S. Army Corps of Engineers	Ms. Shannon Pankratz Engineer 915 Wilshire Blvd. Suite 11095 Los Angeles, CA 90017 213-452-3412 Shannon.L.Pankratz@spl01.usace.army.mil
CWA 401 Permit; wetland delineations	Lahontan Regional Water Quality Control Board	Ms. Cindi Mitton Engineer 14440 Civic Drive Suite 200 Victorville, CA 92392 760-241-7413 cmitton@waterboards.ca.gov

TABLE 5.2-15  
Permits and Permit Schedule for Biological Resources

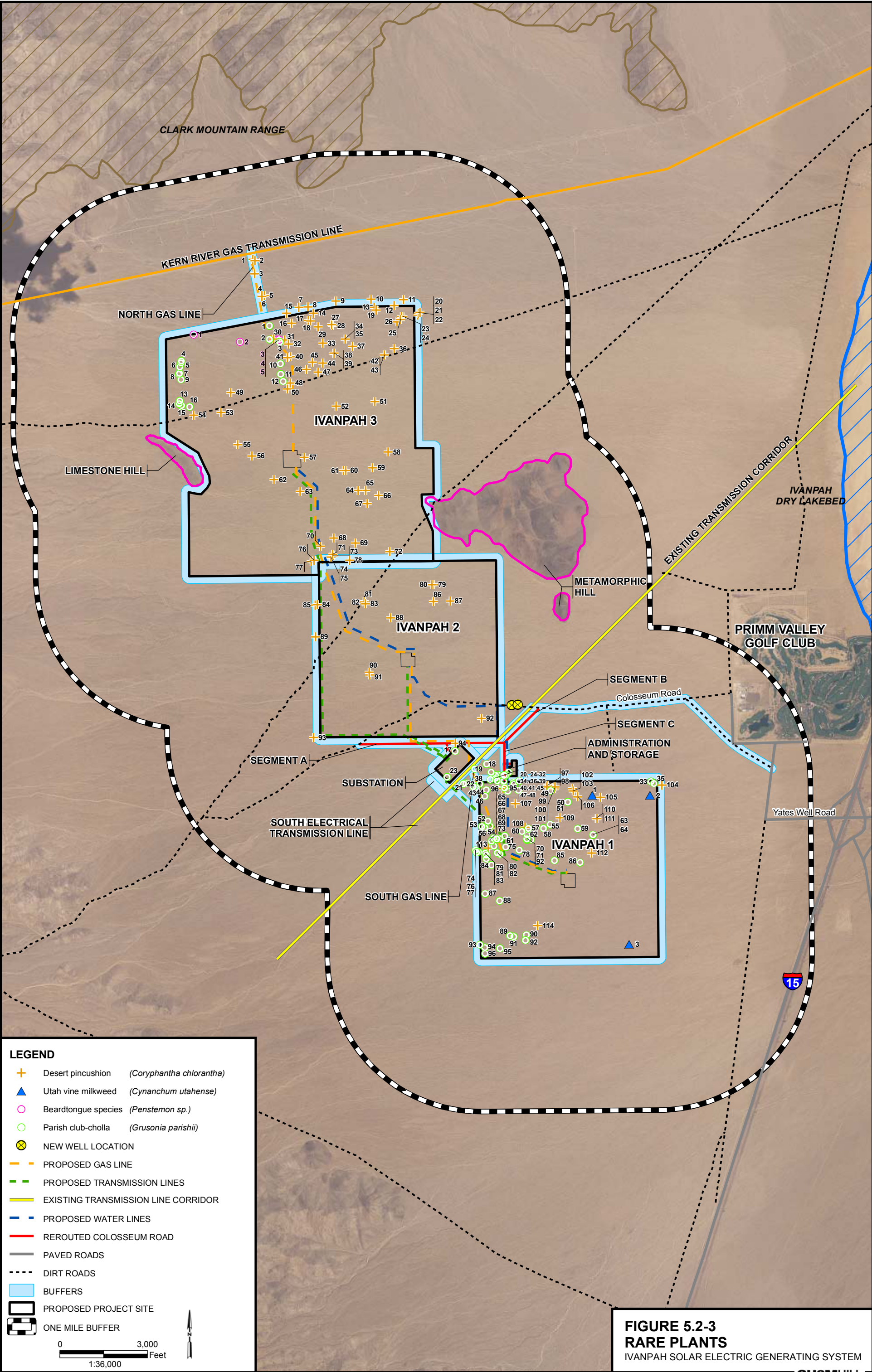
Permit	Agency Contact	Schedule
USFWS Biological Opinion (BO) pursuant to Section 7 of the ESA.	Several desert tortoises were documented within the project area during the protocol survey. The project is expected to adversely affect this species. Need to produce a biological assessment analyzing impacts to desert tortoise and its habitat. BLM will initiate formal Section 7 consultation with the USFWS. USFWS will issue a BO.	6 - 9 months
CDFG 2081 Permit	Need to consult with CDFG and obtain a 2081 permit for the desert tortoise.	6 - 9 months
CDFG Streambed Alteration Agreement (SAA)	Numerous ephemeral drainages were documented within the project site. The project is expected to alter these drainages. Need to identify drainages that will be altered. Need to complete CEQA documentation. Once CEQA is complete, need to submit an application to CDFG to obtain a SAA.	6 - 9 months
USACE CWA Section 404 Permit	It is anticipated that the USACE will take jurisdiction of the ephemeral drainages because they flow into Ivanpah Dry Lake. Need to implement pre-notification in compliance with CWA Section 404 and obtain an individual permit.	6 - 9 months
Lahontan RWQCB CWA Section 401 Permit	It is anticipated that the RWQCB will take jurisdiction of the ephemeral drainages because they flow into Ivanpah Dry Lake. Need to implement pre-notification in compliance with CWA Section 401 and obtain an individual permit.	6 - 9 months



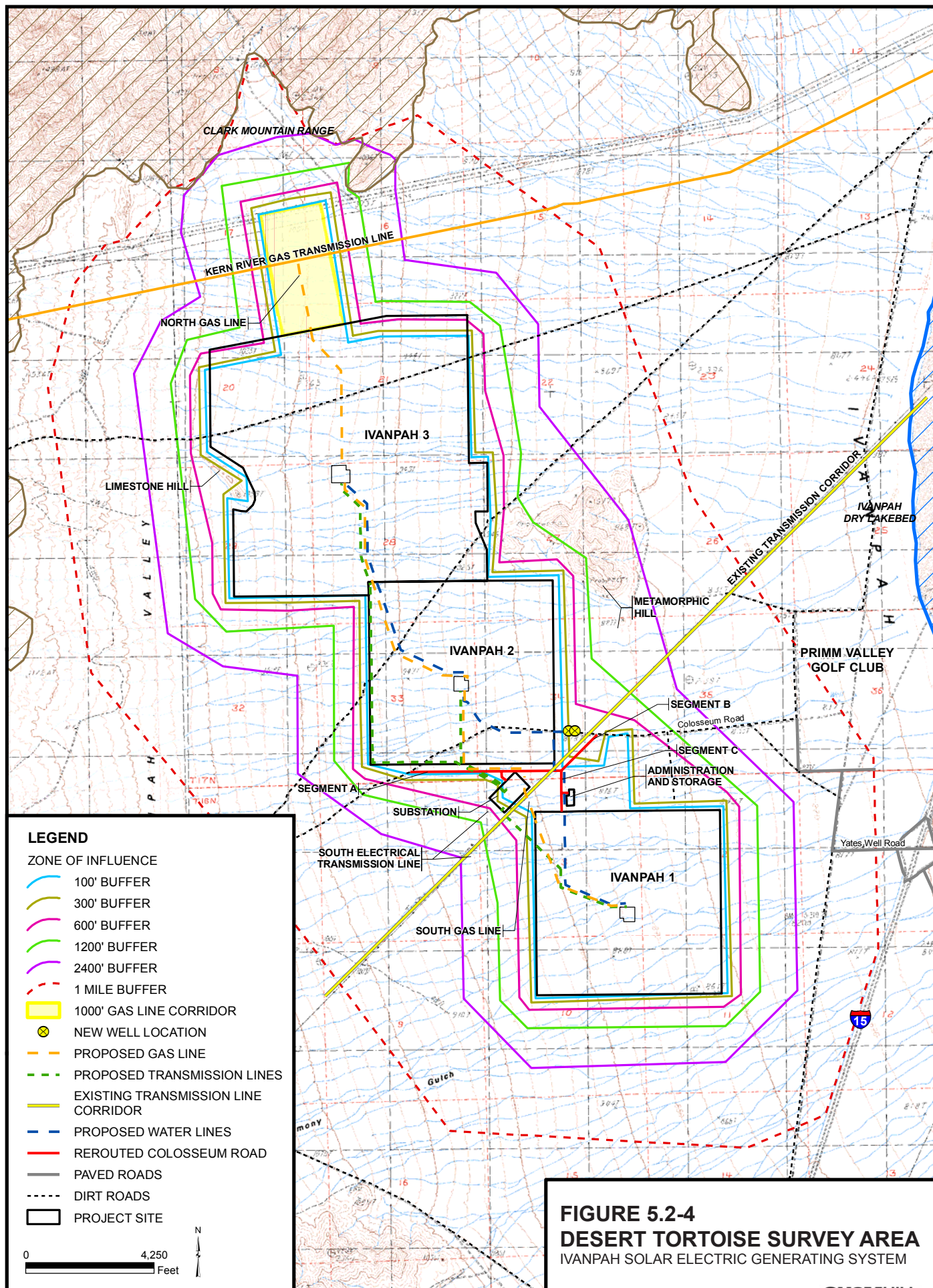




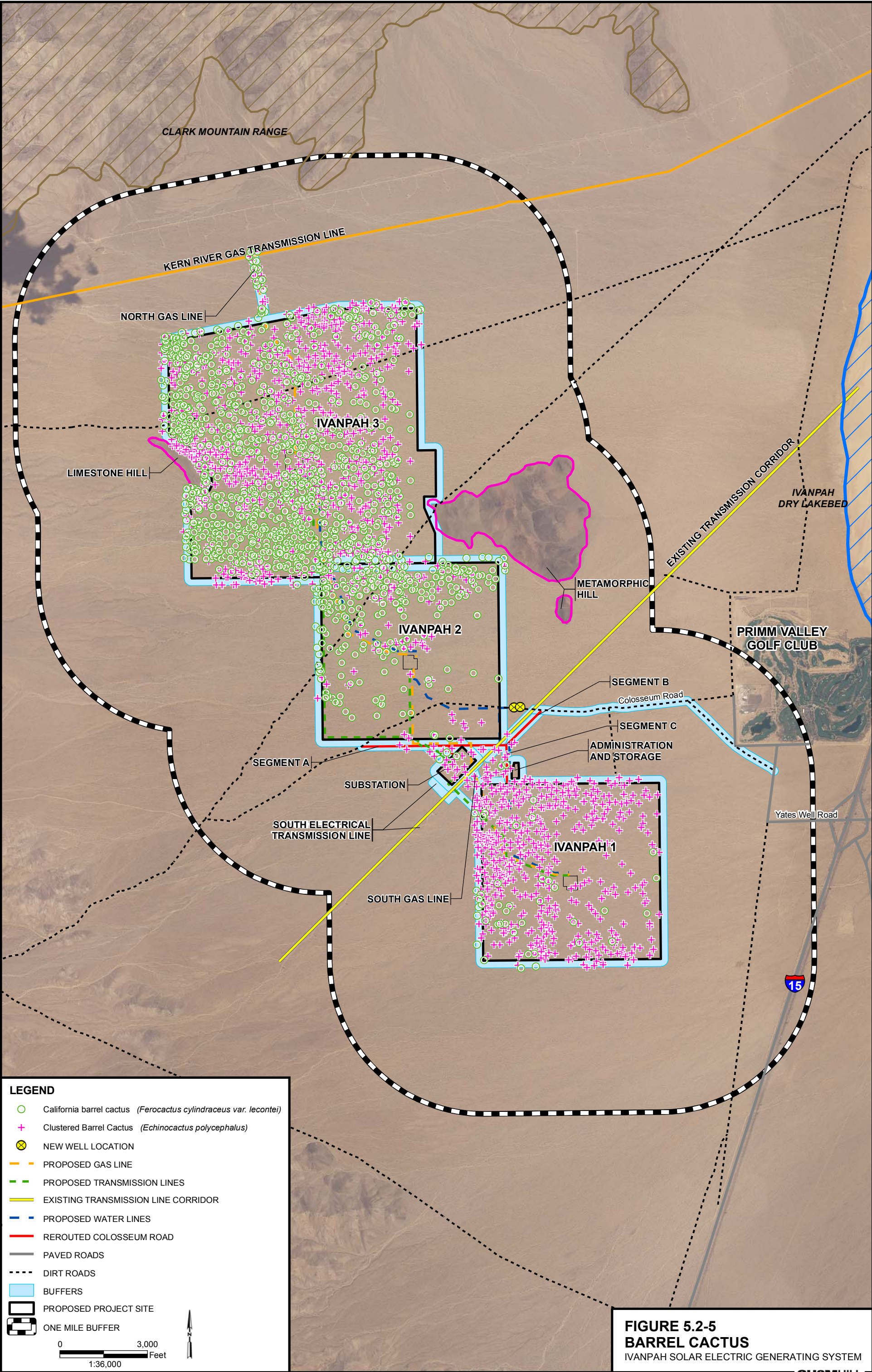












**FIGURE 5.2-5**  
**BARREL CACTUS**  
IVANPAH SOLAR ELECTRIC GENERATING SYSTEM



